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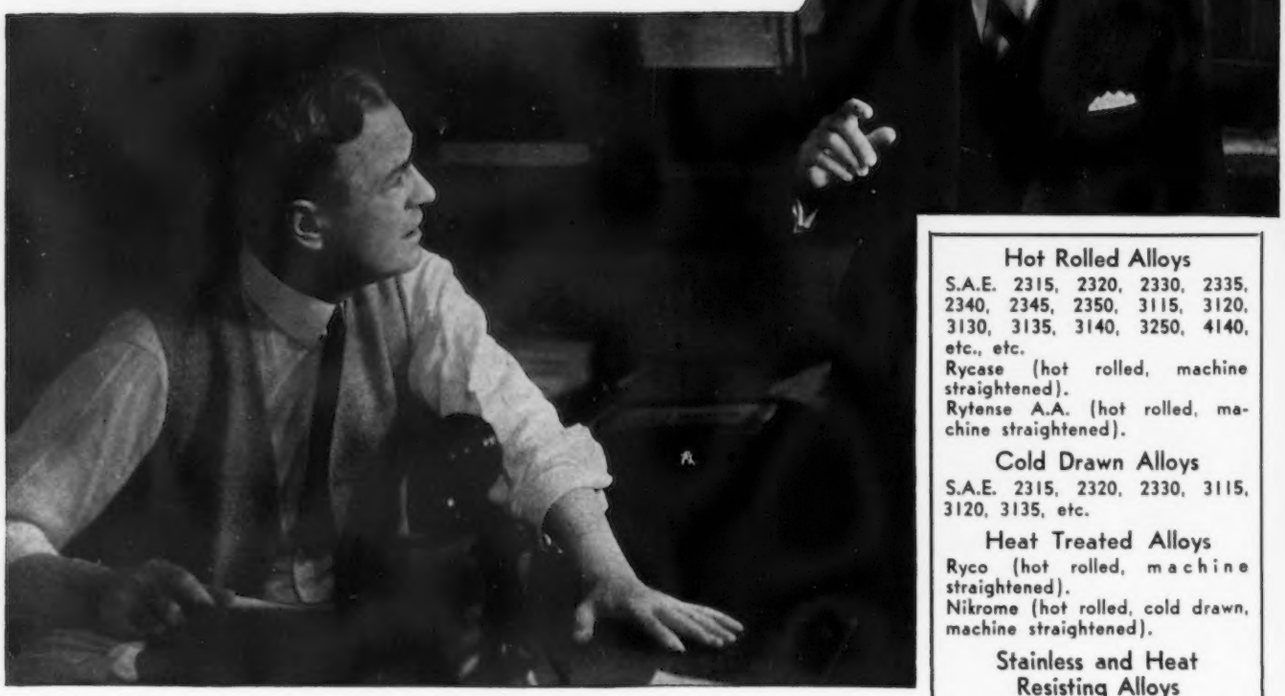

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MAY 16, 1935

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Let Go of Bootstraps—and Ears

ONCE upon a time, they tell us, there was a nation, more or less ancient, whose people met with reverses. Things stopped going as well with them as formerly, for just what reason no one really knew but about which many different opinions were expressed. Everyone agreed, however, that something should be done about it, although what to do was a moot question.

One section of the population, for example, said that the thing for the people to do was to lift themselves out of their difficulties by pulling on their bootstraps. So a great many of the people, including some of the Nation's rulers, had bootstraps immediately affixed to their shoes and proceeded to bend over and pull up on them. It must be admitted that this group was not easily discouraged, in spite of the fact that they did not seem to get anywhere; perhaps that was because the chief bootstrap lifters kept telling them that they were making fine progress and must be patient.

Another section of this strange people was horrified at the idea that progress could be made by pulling upward on one's bootstraps. "The practice of this doctrine," said they, "will surely lead to chaos. The thing to do is to persuade our people to keep their feet on the ground at any cost." So the members of this group, and it was not a small one, proceeded to insure that their feet should stay on the ground by the process of seizing their ears in their hands and pulling downward.

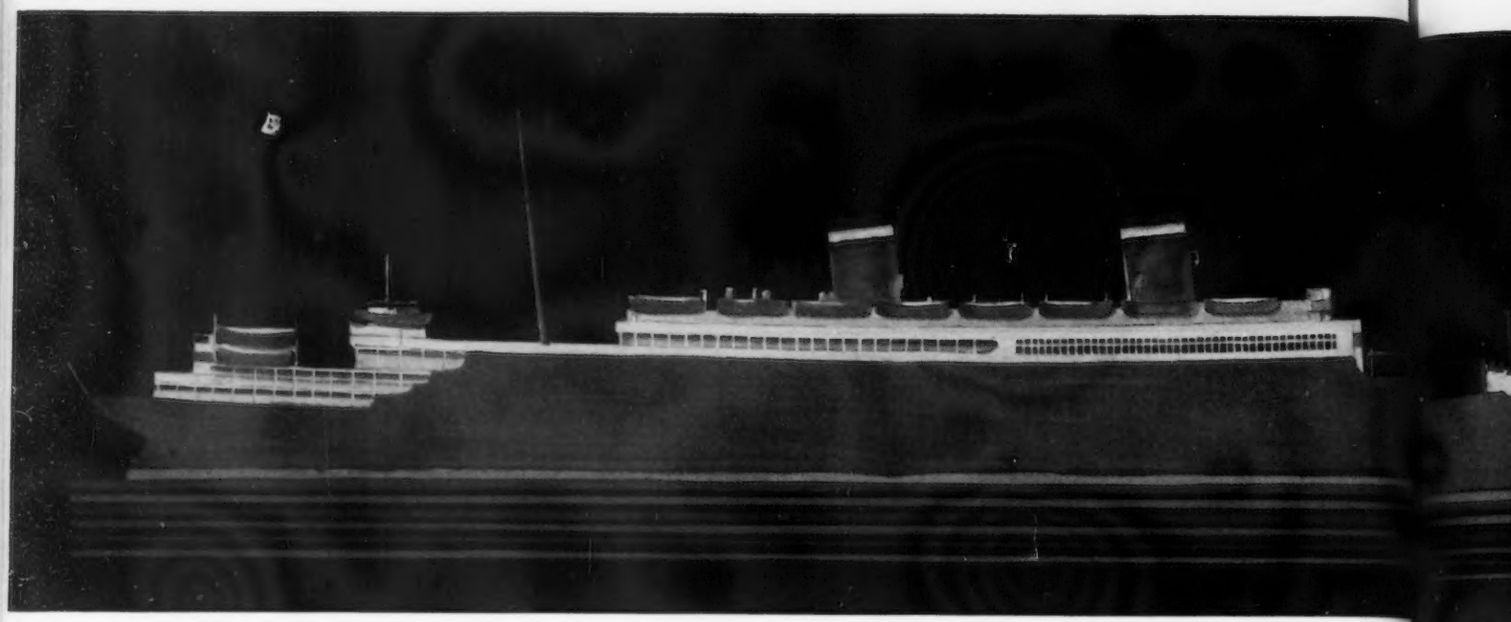
A much smaller group of the people could not bring themselves to a belief in either of these methods of self improvement. They could not see how pulling up on one's bootstraps or pulling down on one's ears could be classified as "gainful occupations" or could get the practitioners anywhere. "Let us take advantage of the situation, while these fellows are thus occupied," said they, "and use our hands to do things and our feet to go places."

These things they proceeded to do, disregarding the discouraging example of the bootstrap and ear pullers alike, and with such good effect that they were shortly out of their difficulties.

* * * * * *

"Them that goes after, gits, in spite of hell and high water."

J. H. VanDeventer



Cleanlined Machines Follow the Trend in

THE maker of machine tools may be little concerned with STREAMlining, in its generally accepted meaning, especially when proposed for application in the design lines of the equipments which he offers for sale. However, the evidence is that he is becoming more and more CLEANLINING conscious. Yet the art of cleanlining may be only one degree or so removed from streamlining and that only through dropping the factor of aerodynamics.

Streamlining dramatizes equipments having locomotive abilities. General conception of the art or design does not particularly associate it with the conservation of human effort in relation to stationary equipments.

Cleanlining is proper terminology and carries a point, when applied to a certain type of betterment which can be made distinctive of a new machine tool period.

In giving comparative thought to the ship illustrations herewith, it is only required, to gain the point, that we recall to mind the outlines of earlier ships, many of which are familiar sights in ocean travel. The superstructures of these are an involved labyrinth of angles, protruding ells with dirt collecting corners, and have a general scheme

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AT the right the consultant-engineer-designer, Otto Kuhler, shows for further comparison the next approaching step, as viewed from the outside, in the accomplishment of perfected details which are directly related to both appeal and to reduction of maintenance cost. Included in these details is the factor of safety. It is to be noted that davits, life boats and rafts are inclosed and that loading and docking apparatus are no longer in sight.

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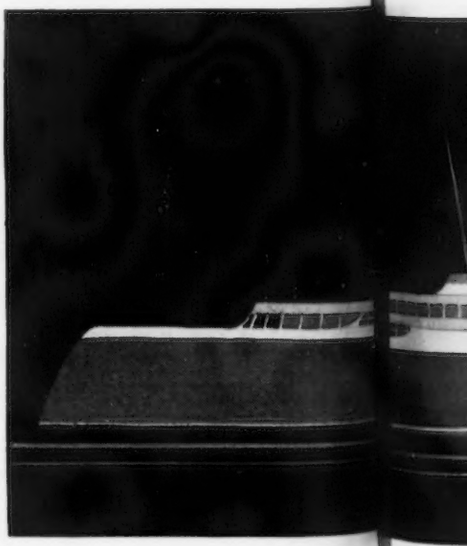

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THE S. S. Manhattan, illustrated at the left, presents lines showing the development of the irresistible trend toward recognition of "appeal" as a factor affecting purchase decisions in connection with transportation. When compared with the design lines of steamships which are easily recalled to mind, the marked trend toward the elimination of all crudeness and the substitution of lines which carry appeal, as well as serve in the reduction of maintenance cost, becomes evident.

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nd in Well-Ordered Appeal

of design-characteristics which requires constant attention from angles of cleaning, touching up, painting and maintenance repairs. Unhoused davits, exposed lifeboats and rafts, not only contribute to expense of constant inspection, often under conditions dangerous to human life, but tend to foster accidents and to increasingly build up maintenance and replacement costs.

A glance at the illustration at the left reveals a clearly evident comparative advantage gained in the superstructure design of the S. S. Manhattan. The old customary angles and corners have sufficiently disappeared for one to visualize little necessity, by comparison for fatiguing effort in dislodging any accumulations which might successfully resist air currents or gravity.

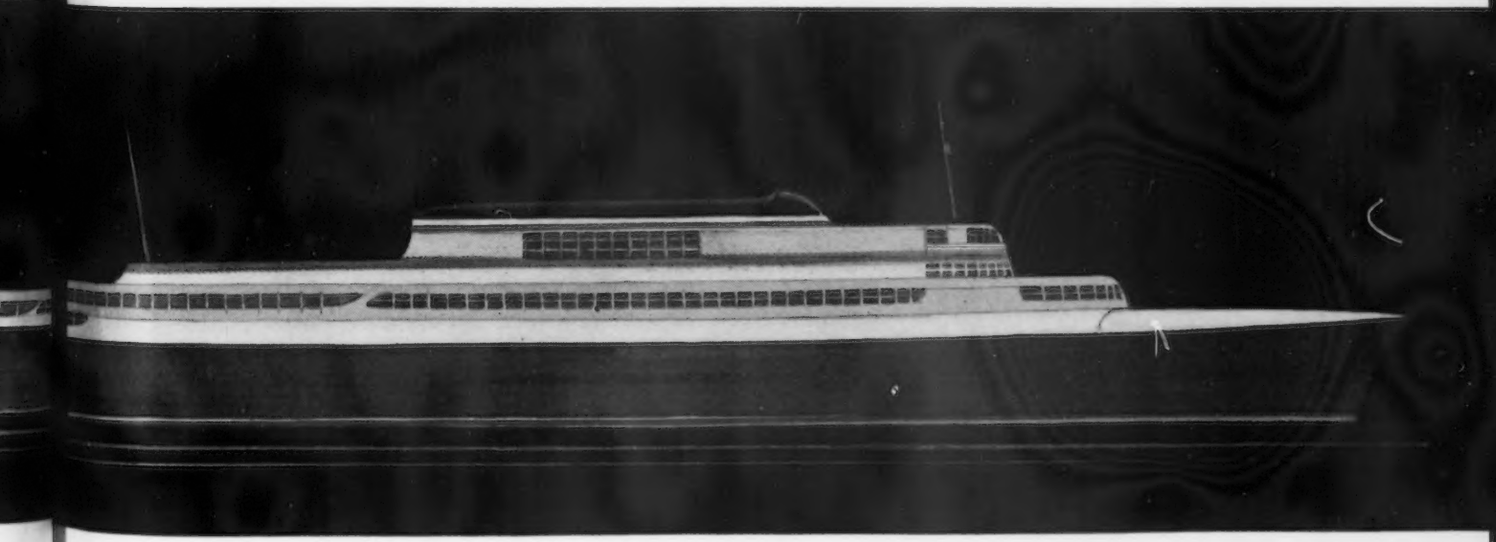
However, a glance at the illustration below convinces us that the engineer-consultant uncovers additional opportunity for further comparative gain, which means maintenance-expense reduction.

Otto Kuhler, designer, collaborating with marine engineers in these proffered examples, demonstrates the fact that the artist-consultant can cooperatively apply his art in a practical way while creating appeal.

There have been many other practical demonstrations in transportation fields, trains, airships and automobiles; all maintained at greatly reduced expense, comparatively.

The sales angle of appearance is today becoming paramount. This has been recognized in many industries. Others have recognized its importance but hate to admit it.

Because of the development of this trend, whether we like it or not, the day of the old angled and cornered designs for machine tools is fading. To get the heightening of the trend it is only necessary to observe design lines in many of the machine tools illustrated in the



rotogravure pages in THE IRON AGE of May 9.

This coming modern machine tool design not only adds to shop morale, operator pride and shop reputation through the agency of appearance which is normally disregarded only by the slothful, but it involves increased productive minutes through the avoidance of constant wiping and cleaning, for example.

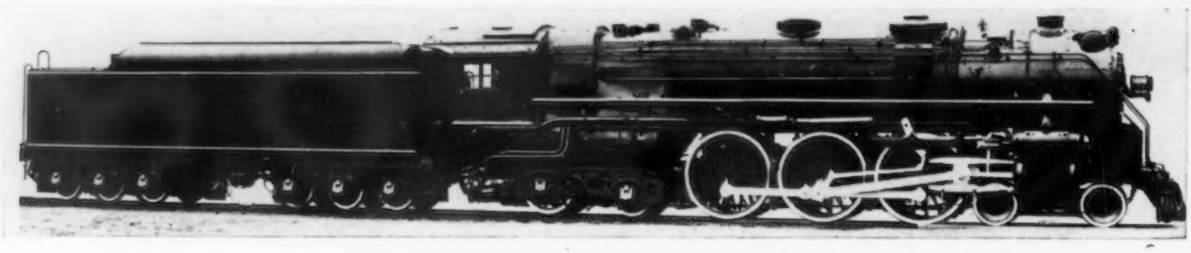
Also the point can be made that this design sets a period-date of equipment manufacture which cannot be obliterated by a scraping tool in the hands of those who would foist upon industry, through claimed rejuvenation, many reglanded equipments of previous decades and of superseded production accomplishments. Thus many machine derelicts of other decades can be forced into the scrap pile, whence they can render real service through the cupola.

Additionally, it should not be overlooked that bankers and investors are far more susceptible to obvious evidences of good management and up-to-date tendencies than they are interested in perfected mechanisms of which they know little, that are so housed as to present to the eye little in the way of progressive appeal.

Modern machine tools, the master tools of industry, can well be given appealing design, indicative of a definite line of demarkation between pre-depression period and the approaching period in which machines must operate at less expense and in a manner to further reduce human fatigue.

The Original Streamlined Steam Locomotive Conception

IN 1928 the original conception of the streamlined steam engine, shown in first color illustration be-



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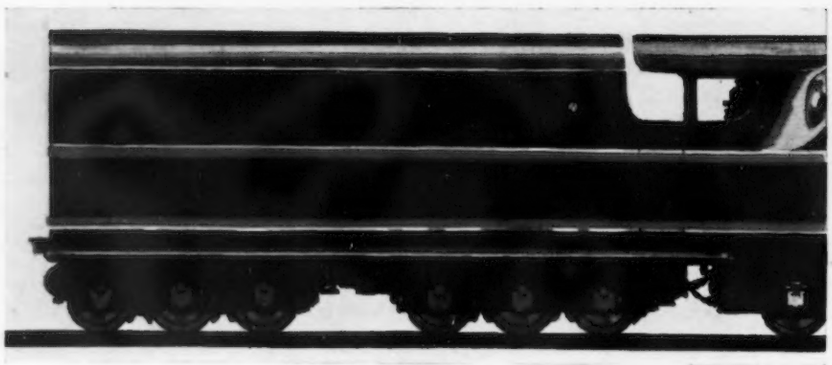
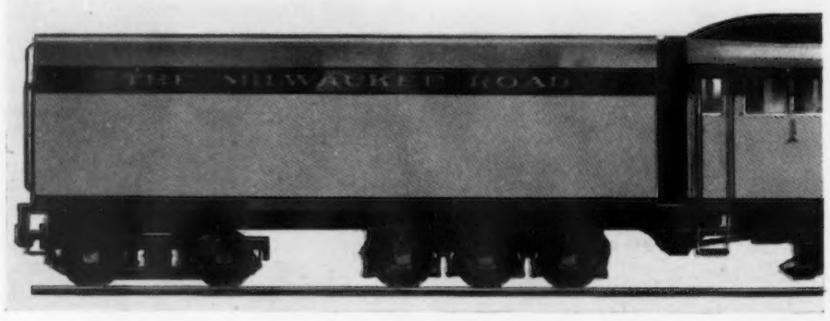
INDUSTRIES at times find themselves in ruts furrowed by loss of customer esteem. For release, they must ultimately re-attract their public—those who buy what they have to offer. Today this step requires clearly visible evidence of a new progressive spirit. Today the visible evidence must carry appeal—some characteristic symbolic of a higher service rating—some characteristic establishing a line of demarkation indicating the close of a period; possibly a period of complacency.



An original conception of streamlined



"Milwaukee" type streamlined steam

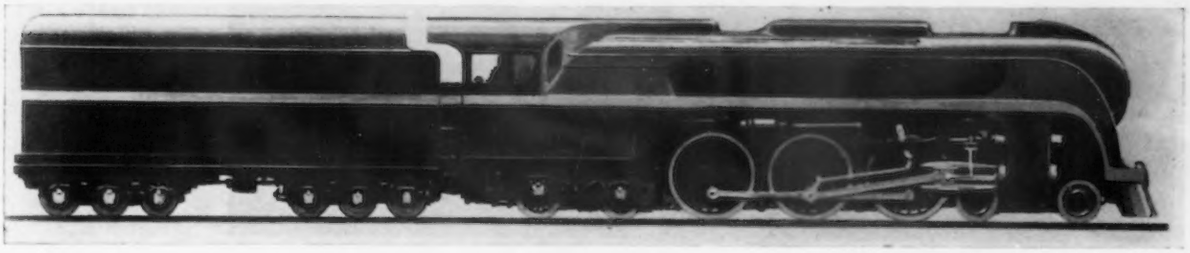
low, was presented in the United States by Otto Kuhler. Practically it went begging until 1931, at which time the American Locomotive Works arranged for collaboration between its engineers and the engineer-consultant who had presented it. The Hiawatha engines, presented to the transportation world a few days ago, and shown at bottom of page are the result of this cooperative effort. In the meantime the idea of colors had come into its own. The interiors of the streamlined trains are a demonstration of cleanlining as an element of cost reduction in maintenance.

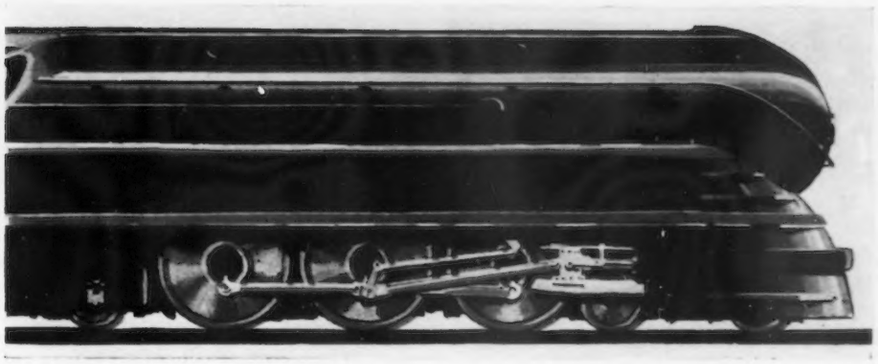
Cooperative Development

THE two illustrations directly below are typical of the cooperative factors entering into the work of the designer-engineer consultant. The illustration at the left is of that splendid type of engine which, in 1931, was possibly considered to be an approximation of the last word in efficient engine design.

The illustration at the right represents the design which was considered as probably necessary to meet new requirements of engine construction. This, after a considerable period of cooperation of strictly engineering sort in the determination of just how the advantages of original design might be made available with no sacrifice of demonstrated advantages.

The "Milwaukee" type, as adopted by the Milwaukee road for the Hiawatha train service, is the final result in a high-speed, high-powered, streamlined locomotive. This engine is shown at the bottom of the page.





steam locomotive.—Otto Kuhler

THIS remittent industrial activity constitutes the closest known approach to perpetual motion and might be called "the grind of progress," of which the streamlined train is the grist of the moment, possibly to be followed by CLEANLINED machine tools.

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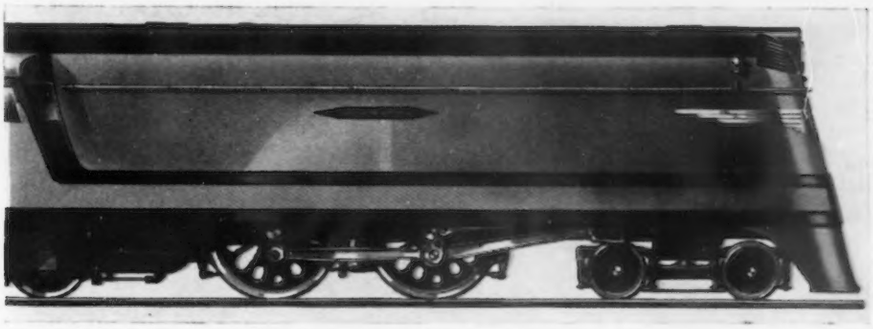
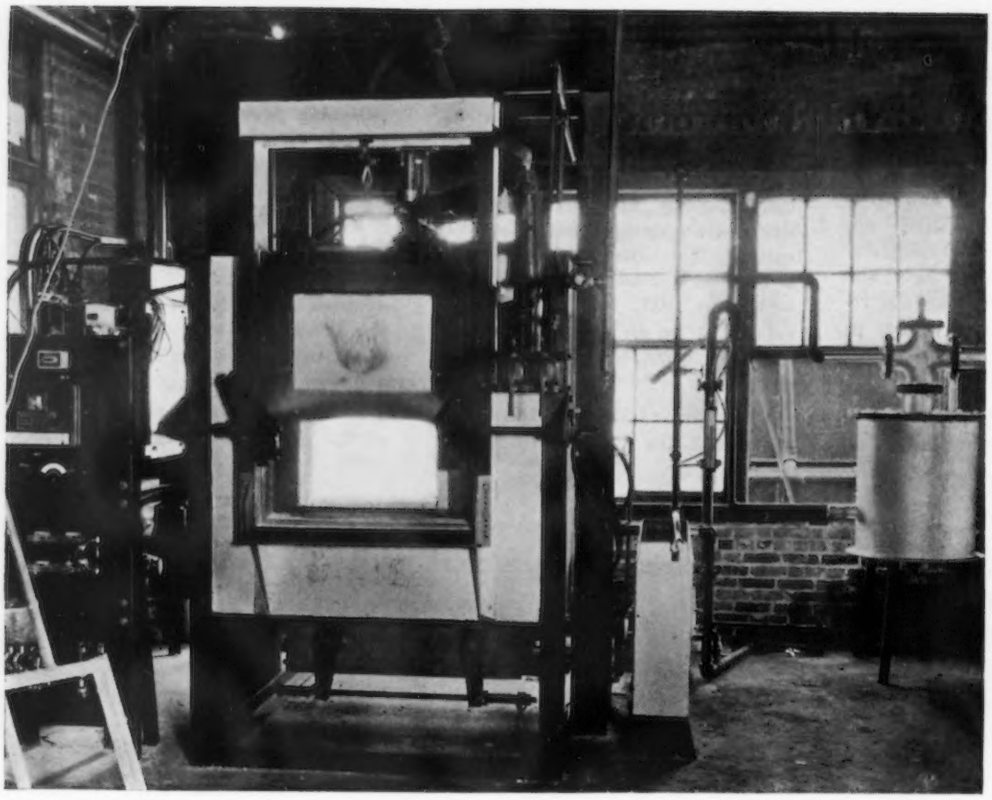


locomotive.—American Locomotive Co.



Special A

A SPECIAL batch-type furnace which was designed for the brazing of evaporators used in mechanical refrigerators. This furnace has been in operation for approximately 18 months and is the third of this type installed in the same plant.

ATMOSPHERIC control is an element of major importance today in the planning of all new heat treating equipment, as well as in modernizing existing equipment for the purpose of meeting modern requirements.

The application of furnaces with atmospheric control to the heat treatment of metals is not new, but its acceptance has advanced appreciably only during the past three years, following the development of equipment and methods permitting the production of suitable atmospheric gases for elimination of oxidization at very low costs.

The gases used for such operations as bright annealing, brazing and other kindred operations prior to about three years ago were for the most part tank hydrogen, or a gas composed of approximately 75 per cent hydrogen and 25 per cent nitrogen, which is produced by the dissociation of ammonia.

By C. L. WEST

Research Engineer
The Electric Furnace Co., Salem, Ohio

The cost of these gases to the user usually ranged from $3.25 upward to $10 per 1000 cu. ft., depending upon the quantities required for the operations involved, and the method of producing them.

Because of their high cost, the gases referred to necessarily had to be used very sparingly. Elaborate furnace designs, particularly with regard to entrance and exit openings, were developed in order to conserve their use.

It was generally believed at that time that a furnace atmosphere suitable for bright annealing, brazing, etc., had to be very rich in hydrogen and other reducing components, and, therefore, several other methods of producing highly reducing atmospheres at lower final costs were experimented with, but the desired results were not fully realized because of the fact that oxygen could not be eliminated from the atmospheres by the methods employed.

It has since been established that very high percentages of reducing components are not only unnecessary but in many cases undesirable, provided that suitable methods are employed in the production of a special atmosphere to eliminate oxygen and to remove moisture to the necessary degree for the problem involved. In this latter regard, we have found that under certain conditions it is quite possible to process material perfectly bright in gases which have not been dehydrated at all, but for the protection of the equipment involved it is desirable in all cases to

Atmospheres in the Heat Treatment and Brazing of Metals

remove a large portion of the moisture from the atmosphere.

Recognizing the fact that there could be no appreciable acceptance of atmospherically controlled furnaces unless a satisfactory atmospheric gas could be produced at a very reasonable cost, the problem was submitted to our research division with the following results:

1. A long and exhaustive series of experiments were conducted utilizing various types of gas-producing apparatus and many mixtures of gaseous elements at various temperatures for reacting the elements or mixtures of elements in the presence of various types of catalytic materials.

2. All of the resultant atmospheric gases were applied to use in a practical production furnace in the heat treatment of ferrous and non-ferrous metals, throughout the entire range of practical metal temperatures for the materials involved, and the results with regard to surface conditions, physical properties, etc., were recorded for each test.

3. During the process of elimination we discovered that the gases which are used in the furnace exhibits which are to follow, and which we choose to call Elfurno gases were not only the cheapest to produce but most desirable for the reason that they provide for flexibility of control which was not, heretofore, obtainable. We found that when we were successful in eliminating practically all oxygen from the atmospheric gas we did not need excessive amounts of hydrogen and other reducing components, which feature resulted

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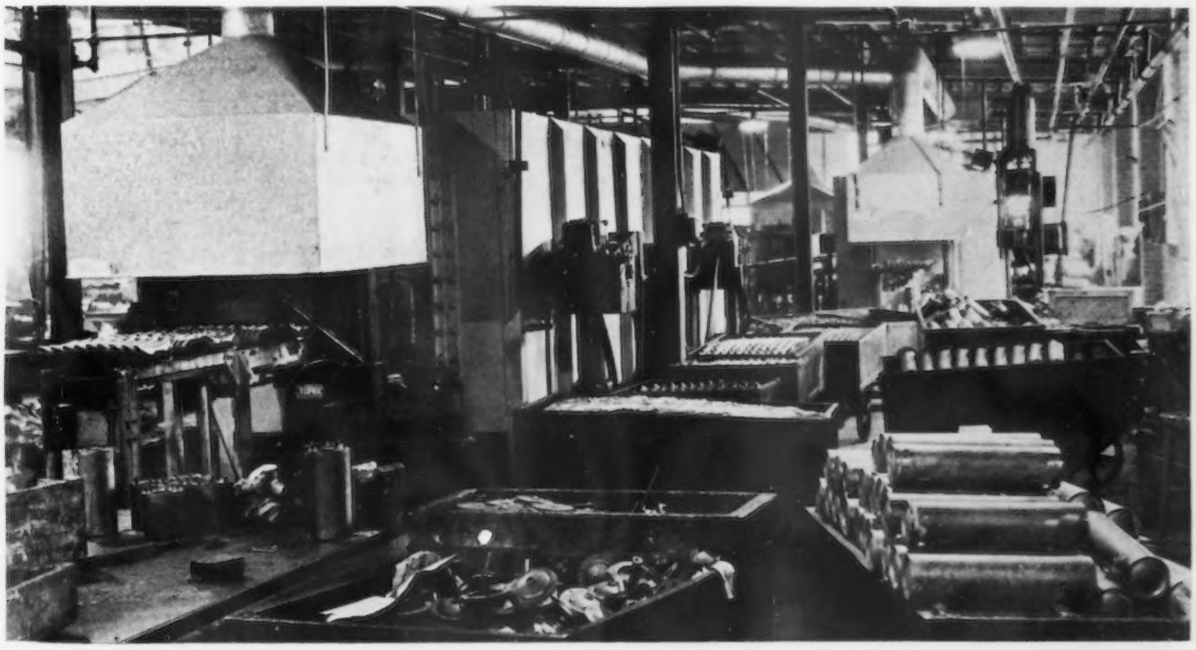
TWO pusher-type furnaces used for the brazing of a great many assemblies of steel products used in mechanical refrigeration units and in the automotive industry. The material is conveyed through the furnace and the attached cooling hood on special heat-resisting alloy shoes, which are equipped with light removable upper supports designed to suit the sizes and shapes of the various products involved in the production program. The operation of this equipment, with the exception of manual loading and placing of the shoes before the pusher head, is entirely automatic, and the mechanically ejected loaded shoes are returned to the starting point.



in lowering the cost of atmospheric gases beyond our expectations.

Made by Burning Carbonaceous Gases

The Elfurno gas atmosphere is produced by the simple process of combustion of carbonaceous gases suitably proportioned with quantities of air in a special gas-producing apparatus at properly controlled temperatures, at a cost ranging from 10c. up to 20c. per 1000 cu. ft., including maintenance cost for the gas-producing apparatus.

It will readily be appreciated that an atmosphere which can be produced so cheaply can be applied to large furnaces in the processing of relatively cheap materials, where large entrance and exit openings are necessary for the passage of materials, and still be a minor item of manufacturing cost.

Taking advantage of this fact, it became entirely practical to utilize quite simple designs of equipment with regard to entrance and exit openings, thus tending toward lower first cost of equipment and reduction in operating hazards from the standpoint of shutdowns and maintenance.

Among the first large commercial installations utilizing Elfurno gas atmospheres were three straight through pusher-type furnaces for copper brazing of steel refrigerator parts, and one continuous conveyor-type furnace for bright annealing copper tubing in long, straight lengths and in coils up to 3 ft. in diameter by 10 in. high.

These units referred to have been in substantially continuous operation going on to three years.

The success of these large installations has resulted in the installation of over 30 additional atmospherically controlled furnaces of relatively large capacities, which furnaces are used for processing a wide variety of materials.

These equipments were all built during a period when large appropriations were most difficult to obtain, and only the large savings and increased quality of the products effected by the new methods made it possible to obtain the necessary funds to make these installations.

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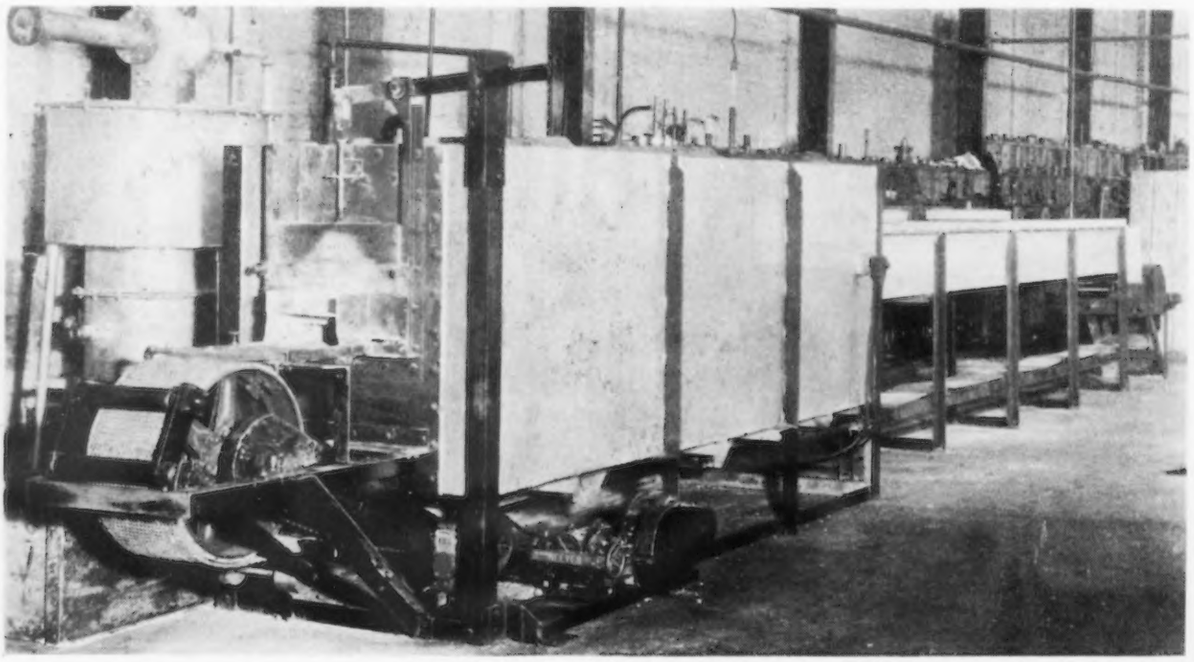
Several designs of furnace equipment lend themselves to practical applications of atmospheric control, such as special batch types, chain conveyor or chain belt conveyor types, roller-hearth types, straight through pusher types and counterflow or return recuperative pusher types.

The selection of equipment for any given problem depends upon such factors as operating temperatures, shapes, sizes and weights of products, quantity of production, continuance or frequency of operation, ultimate results desired and costs of labor, power, gas, water and other elements entering into manufacturing costs.

In this respect it is well to note that no single type of equipment is applicable to all of the problems encountered, and very serious difficulties may be encountered with regard to maintenance if the wrong type of equipment is selected for such operations as brazing, where the furnace alloys are subjected to temperatures near their upper limits.

It is also to be noted that a comparatively small furnace of a given type with regard to conveying means may be ideally suited to the high temperature brazing of a given product, whereas a large furnace of the same general type may be entirely unsuited or economically impractical, even though the problem looks parallel to one not versed in the practical values



A CONVENTIONAL wire mesh belt-conveyor type furnace used for bright annealing stampings and brazing pulleys and many other products. This furnace was installed primarily for brazing steel hubs to the webs of automotive and other types of V-belt pulleys, displacing other methods of joining. The brazing method of joining eliminated many causes of failures which had previously been experienced, provided for neater and lighter pulley assemblies and an appreciable reduction in manufacturing cost due to changes in design which were permissible with the brazing method of joining the parts.

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STANDARD chain belt design of furnace used for the clean and bright hardening of bolts, screws and many other small and medium-size finished products. This furnace design incorporates a cast link alloy conveyor which runs inside of the furnace, except for a short section which is exposed at the charging end to facilitate loading of the parts to be heated. Fundamentally, the design of the furnace deviates from a large number of previous installations of its type only in that the furnace shell is made gas tight and an Elfurno atmosphere is used to prevent oxidization of the materials to be heated for quenching.

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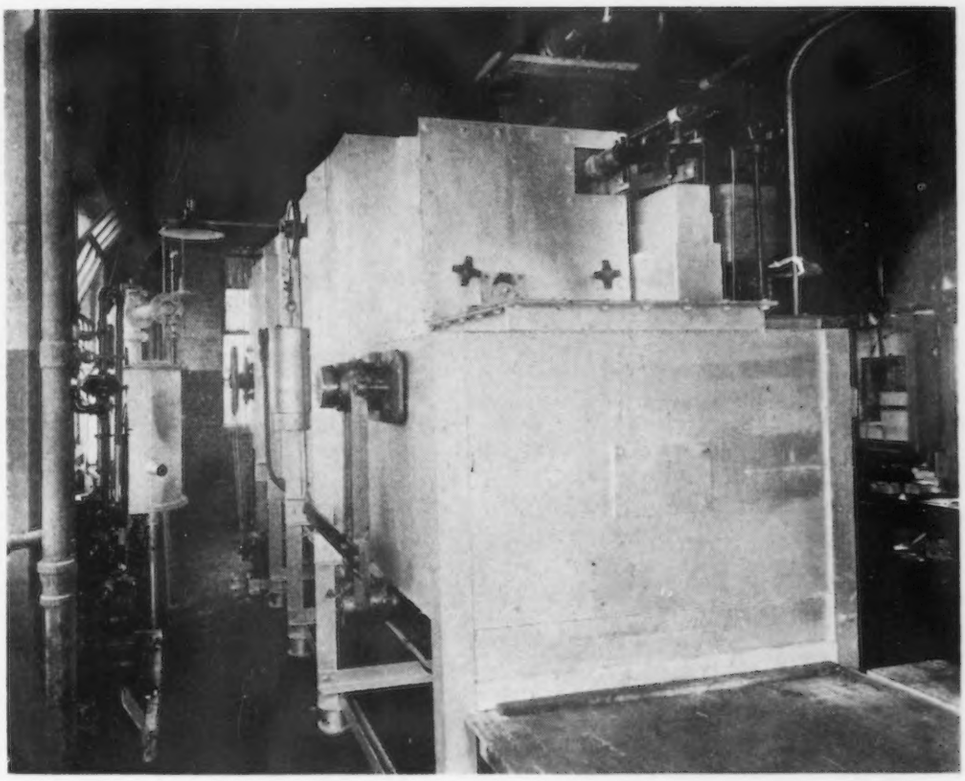


of heat-resisting alloys with regard to permissible stresses at these very high temperatures.

A few of the practical uses of Elfurno gases incorporated in the many installations referred to above are briefly outlined as follows:

Brazing of Ferrous and Non-Ferrous Metals

The union of two or more parts forming an assembly in a continuous furnace brazing operation, replacing such methods of joining as riveting, bolting, crimping, staking and the various forms of welding, provides for greater economies, neater assemblies and elimination of pickling operations because no oxides are formed in the brazing operation. Further, there is no compromise with regard to mechanical strength of the assemblies thus formed.

Where electric furnaces are used for the brazing operation, the parts are heated to temperatures ranging from approximately 1400 deg. F. where silver-bearing alloys are used as a brazing medium, approximately 1850 deg. F. where copper-zinc alloys are used as the brazing medium, and up to a maximum of 2100 deg. F. where copper is used as the brazing medium.

The requirements leading to the successful brazing of an assembly of stampings, forgings and screw machine parts are that they be reasonably clean upon entering the furnace, that the joints be reasonably tight and that the assembly be self-sustaining with regard to maintaining proper registration of the parts during the travel of the assembly through the furnace equipment.

Excepting for very special brazing operations, the brazing medium in the form of wire is placed upon the assembly, around each joint or section to be united, adjacent to the point of union and not between the parts.

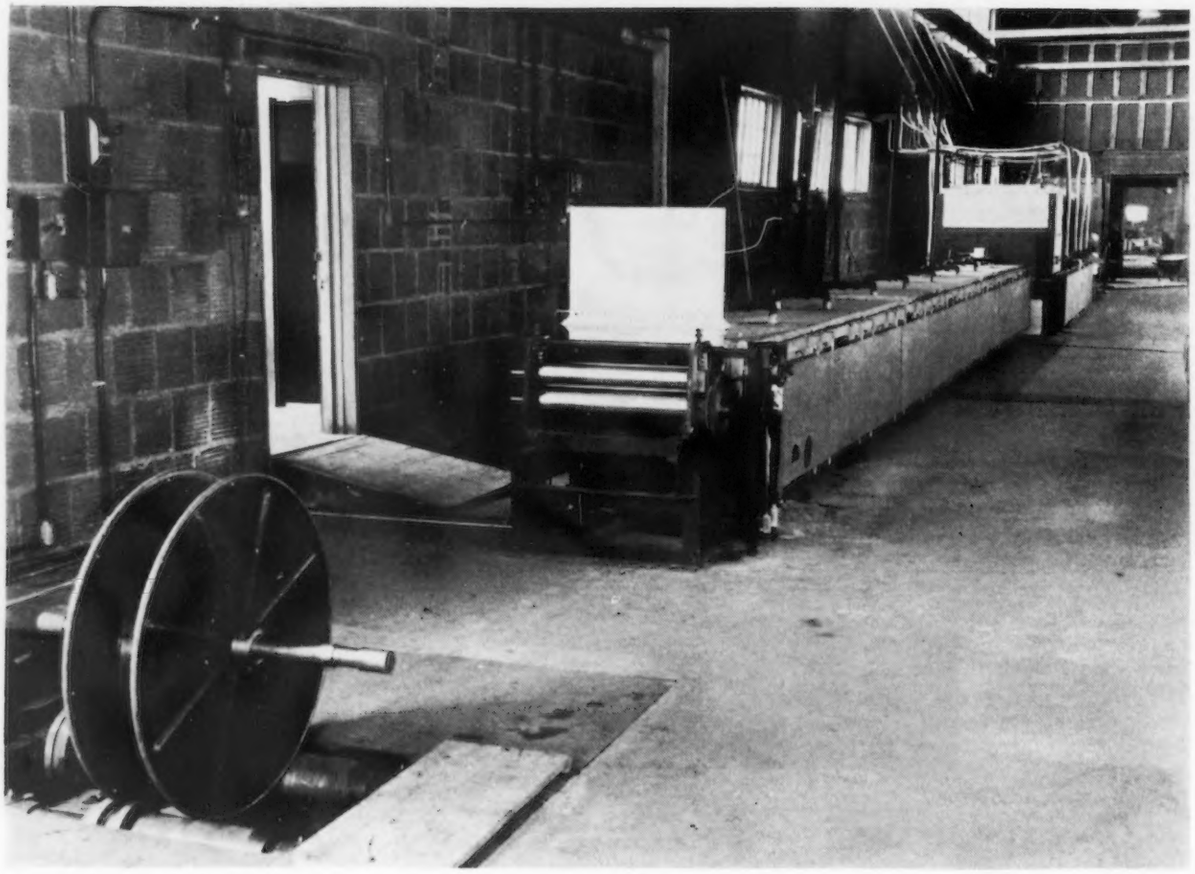
In cases where wires cannot be used because of inability to sustain them in their proper relation to the desired point of contact, we resort to the use of a stripe of paint made up of finely powdered copper, lacquer and thinner applied around the joint adjacent to the junction of the parts in question. Assuming that the assembly has been suitably prepared, it is then placed upon the furnace conveyor and, in passing through the furnace, is heated to a temperature slightly above the melting point of the brazing medium. Capillary attraction comes into play at this point and the liquid brazing material is drawn through each joint. The assembly then passes into a cooling chamber which is attached to the furnace where the assembly is cooled in the gas atmosphere to a temperature below the discoloring range.

The normal result of the operation is a union of parts which for all practical purposes is indestructible, and in the case of hollow receptacles is sufficiently tight to hold many types of gases or liquids at pressures up to the bursting point of the metals from which the assembly has been fabricated.

Bright Annealing of Ferrous and Non-Ferrous Metals

The bright annealing or normalizing of many steel products such as tubing, sheet, strip steel, stampings, etc., has been reduced to quite simple practice in roller hearth type, conveyor type and pusher recuperative type furnaces. Generally speaking, the operating temperatures for this class of work range from 1350 deg. F. for some annealing operating on low-carbon steel products up to 1750 deg. F. for normalizing similar products, and as high as 2000 deg. F. for processing special silicon steel.

Bright annealing of copper tub-



ROLLER-HEARTH type furnace used for bright annealing cold-rolled steel strip, special silicon steel strip and other strip products. In this type of equipment, strip products are annealed or normalized at temperatures ranging from approximately 1350 deg. F. up to 2050 deg. F., depending upon the materials involved and the physical properties desired in the finished materials. The operation of this equipment involves the use of suitable unreeling equipment at the charging end and reeling equipment at the discharge end, all of which is synchronized with the speeds of the driven rollers forming the conveying means in the furnace equipment.

ing is standard commercial practice today in the plants of four large manufacturers of this product, utilizing electric furnaces of a conveyor type, and special atmospheres, produced by the same general methods as previously described, except for certain additions to the gas producer equipment for the purpose of removing sulphur which would cause staining or discoloration of the surface of the copper tubes if not eliminated.

An important contribution to the art of bright annealing during the past year has been the development of apparatus and methods of producing a gas atmosphere which can be applied in necessary quantities for the requirements of a continuous furnace used for bright annealing of very thin electrolytic or other forms of non-deoxidized copper strip at temperatures up to 1000 deg. F. without injuring the material as regards its physical properties. The operation has been demonstrated in a large production furnace using a heating and cooling cycle which covered several hours, and the results obtained were entirely satisfactory.

Clean Annealing or Controlled Oxidization

The production of this special atmosphere at the starting point involves the same general principles as for producing more simple atmospheres, but certain components of the atmospheres have to be controlled to a finer degree than is ordinarily necessary.

The actual control of these components has, however, been worked out to provide for very simple operation and its use is commercially practical for production purposes.

Another problem for controlled atmosphere is what we choose to call clean annealing, or the production of a controlled oxide on steel products in an electric furnace containing a special atmosphere for this purpose.

In certain cases we have found it necessary to treat material, which was coated with a thin, tight oxide, in a neutral atmosphere in which there would be no reduction of the existing oxide and no addition of oxide to that already in evidence.

In other cases, the desired result was to produce a very light oxide or coloring of materials as a means of rendering them more resistant to corrosion than they would normally be if delivered from the furnace equipment with a bright surface.

These results are obtained through modifications of the furnace atmosphere.

Clean Hardening and Carbon Control

Another use for controlled atmosphere is found in the scale-free heating for quenching and drawing of a very wide variety of

(CONTINUED ON PAGE 86)

Use of Cast Iron Scrap in Cupola Expedited By Addition of High Silicon Iron*

CAST IRON scrap has been a regular part of the cupola charge since the beginning of the gray iron industry. In any foundry there is a certain accumulation of scrap cast iron from rises, sprues, gates, imperfect castings, etc. This material constitutes from 20 to 60 per cent of the iron poured. The most economical way of disposing of this iron is to charge it back into the cupola. Hence, in practically every gray iron foundry this "return" scrap forms an important part of the raw material charged into the cupola.

In former years the practice followed was to make up the remainder of the charge with pig iron of the foundry grade, usually a No. 2 grade with silicon 1.75-2.25 per cent.

In recent years the practice of adding some steel scrap to the charge has become quite common. This steel is substituted for an equivalent amount of pig iron. The loss in silicon due to the addition of steel is made up ordinarily by using the correct amount of silicon alloy in the charge, usually silicon (silvery) pig iron (Si 6 to 15 per cent). The resulting iron, if proper cupola practice is followed, is usually harder, stronger, and tougher than that produced from a pig and return-scrap mix. The improved properties of this so-called high-test iron or semi-steel are due to the lowered graphitic carbon content brought about by the use of steel scrap in the charge. The lower total carbon content makes it necessary to carry the silicon content somewhat above normal if proper graphitization is to be secured.

Decreasing the percentage of carbon in the charge brings with it increasing difficulties in melting and casting. The machinablity of the iron also decreases. For these reasons, the percentage of steel scrap in the mix is in most cases, except where unusually high strengths are desired, kept under 20.

Pressed with the need in the last few years for lowered costs, the foundryman has turned his attention to cast iron scrap. Large quantities of a good quality of this material have appeared on the market, often at very low prices. If appreciable quantities of this material can be used in the cupola charge, a marked saving in the material costs can be made. Many foundries, of course, have made a practice of using quantities of foreign cast iron in their charge. In most cases of this kind it has been found desirable to increase the silicon content of the charge by ferro-silicon additions in some suitable form. Little information, however, is available concerning the general results of using large percentages of cast iron scrap in the cupola charge.

By A. H. DIERKER

Senior Research Engineer, Engineering and Experiment Station, and R. P. Schneider, Assistant Professor of Industrial Engineering, Ohio State University, Columbus, Ohio.

Details of Investigation

In an attempt to secure some comparative data on this subject, a series of melts were run in a small cupola using various proportions of scrap in the charges. The cupola used is located in the foundry of the industrial engineering department, Ohio State University. The shell was 36 in. in diameter and was lined down to 22 in. inside diameter with fireclay cupola blocks. Blast was furnished by a small forge blower.

Without means of either measuring or controlling blast pressure, the equipment was not perfect. Nevertheless, it was felt to have one advantage, in that the results secured should be reproducible in the average small foundry with similar equipment.

The cupola described is used for instructional work in foundry practice. Small, thin section castings are molded and poured by engineering students. For this purpose the iron is kept soft and easily machinable. The return scrap from sprues, risers, defective castings, is rather high, as might be expected. The make-up of the regular charge is shown as No. 1 in Table I. This mix was used as a starting point for our investigation.

For determining physical properties, the iron was poured into standard arbitration bars 1.2 in. in diameter by 21 in. long. In each case at least three sets of bars were poured, one set near the beginning of the melt, one near the middle, and the third close to the end.

The bars were tested transversely on 18-in. centers by the set-up shown in Fig. 1. Deflection readings were taken at each 500 lb. increase in load. The tensile bars were machined from the broken half of the transverse bar. These were machined to 0.800 in. diameter according to A.S.T.M. tentative specifications, A 48-32T for gray iron castings. In addition, an unbroken 1.2 in. transverse bar was machined to 0.875 in. diameter and tested transversely on 12-in. centers. It was felt that the ratio of strength between this

*Abstract of an investigation made by the Ohio State University Engineering Experiment Station, in cooperation with the Globe Iron Co., Jackson, Ohio.

bar and the standard unmachined bar is an indication of the uniformity of physical properties of the metal from surface to center of the castings.

The results of the transverse test of the standard 1.2-in. diameter bar were plotted, load against deflection. The area under the curve was carefully measured and the results in inch pounds reported as the resiliency. This resiliency has been found to be a fair indication of the impact resistance (toughness) of the iron.[1] Brinell impressions were made at the center of the broken transverse bar close to the point of fracture. The modulus of rupture was figured according to the standard formula for a steel beam supported at both ends and loaded in the middle.

Source of Raw Materials

The analyses of the raw materials used in the charges are shown in Table II. The return scrap was obtained from a pile that had accumulated in the foundry. The No. 2 pig iron was a standard grade of this material. The machinery scrap and steel scrap were obtained from a local scrap dealer. The stove plate scrap consisted of broken up blacksmith forges. Silicon was introduced in the form of blast furnace ferro-silicon. (Silvery iron).

Blast furnace ferro-silicon is essentially an iron-carbon-silicon alloy in which the carbon decreases as the silicon increases. It has a melting point and density comparable to that of ordinary foundry pig iron. This coupled with the fact that the silicon is in dilute form makes possible a uniform distribution of this element in the melt with a minimum of melting loss.

Manganese was adjusted by using two grades of silvery iron, one high and one low in manganese. The analysis of these two grades is shown in Table II.

The coke used consisted of half by-product foundry coke and half bee-hive foundry coke, both lots being obtained from local foundries. Limestone equivalent to 18 per cent of the coke charge was placed on each charge. Ten pounds was placed on the coke bed itself before the start of charging. As only four charges were run to each melt, the slag was not tapped. The coke ratio was 6½ to 1. The height of the coke bed averaged 30 in. above the tuyeres.

The results of the physical tests of the various irons are clearly shown in Tables III and IV. In most cases a good pearlitic structure was secured throughout.

Melts 7 and 9 were designed primarily for enameling purposes. Small samples ⅛ x 2 x 4 in. poured from these melts were successfully enameled in the laboratory. However, since successful enameling depends as much, if not more, on the enamel used and technique employed as on the metal used, these tests are not considered conclusive.

Metals 7, 9, and 12 were successfully poured gray in ⅛-in. section castings. Irons of this type should prove satisfactory for castings of quite thin section, say ¼ in. and under.

High physical strength, however, is not always a suitable measure of a quality iron. Good

[1] Report of Committee A-3, *Proceedings A.S.T.M.*, Vol. 33, Part 1, p. 87, 1933.

TABLE I—MAKE-UP OF CHARGES FOR THE MELTS SHOWN
FIGURES SHOW PERCENTAGE OF TOTAL CHARGE

Melt No.	No. 2 Pig	No. 1 Pig	Machinery Scrap	Stove Plate	Return Scrap	Steel	Silvery Std.	Silvery High Mn.
1	29	21	..	..	50	..	..	..
2	21	..	23	..	50	..	3	3
3	..	..	29	15	50	..	..	6
4	..	..	17	..	50	21	6	6
7	16	..	20	9	40	..	4	11
9	15	..	..	23	53	..	9	..
12	..	..	28	14	50	..	3	5

TABLE II—ANALYSES OF RAW MATERIALS

	T.C	Si.	S.	P.	Mn.
No. 2 Pig	3.5 to 4.0	1.80	.029	.20	.93
No. 1 Pig	3.5 to 4.0	2.92	.023	.40	.80
Returns	3.45	2.00	.060	.35	.70
Cast Mach. Scrap	3.41	1.57	.094	.29	.55
Stove Plate Scrap	3.50	2.15	.090	.50	.56
High Carbon Steel	1.30	.17	.020	.05	.60
Silvery Pig Std.	1.75	10.50	.025	.100	.50
Silvery Pig High Mn	1.75	10.56	.025	.104	2.93

TABLE III
RESULTS OF TESTS OF 1.2 IN. X 21 IN. A.S.T.M. TRANSVERSE BAR

Melt No.	Transverse Strength Lbs.	Deflection In.	Modulus Rupture lbs./sq in.	Resiliency in Lbs.	Brinell Number	Tensile Strength lbs./sq. in.
1	1847	.290	48760	329	163	20760
2	1995	.295	52750	353	168	24450
3	2288	.284	60930	379	197	33650
4	2550	.243	67550	347	217	35640
7	1670	.248	44650	231	163	22400
9	2040	.274	55400	295	179	26500
12	2130	.328	56030	376	176	23310

TABLE IV
RESULTS OF TEST OF .875 IN. X 15 IN.
TRANSVERSE BAR MACHINED FROM 1.2 IN. DIAMETER BAR.

Melt No.	Transverse Strength	Deflection	Modulus Rupture
1	970	.194	44200
2	1250	.226	57100
3	1485	.202	67550
4	1590	.172	72600
12	1180	.199	54300

TABLE V
ANALYSES OF MELTS

Melt No.	T.C.	Si.	S.	P.	Mn.
1	3.56	2.07	.045	.378	.61
2	3.51	2.18	.050	.310	.67
3	3.31	2.24	.083	.347	.64
4	2.98	1.90	.102	.262	.71
7	3.43	2.91	.060	.207	.59
9	3.26	2.89	.058	.23±	.49
12	3.33	2.47	.089	.308	.53

[2] H. Bornstein, *Trans. A. F. A.*, Vol. III, N. 4, June, 1932.

machinability is often more essential than strength. Bornstein[2], in substituting scrap cast iron for pig iron and maintaining a constant composition, found the resulting iron "too strong" for the purpose intended.

In the absence of massive cementite, machinability undoubtedly varies with the size and distribution of the graphite flakes. For example, iron from melt No. 12 might be expected to have about the same machinability as iron from melt No. 1. On this basis machinability should be controllable by regulating the silicon content in the charges. Although no comparative tests were made, all of the irons listed in the tables showed good machining qualities.

These tests demonstrated that a high percentage of cast iron scrap in the cupola charge is not necessarily indicative of a low quality iron. In fact, with careful selection of scrap and proper cupola practice, it should be possible to consistently produce a quality iron with small percentages of pig iron in the charge. Proper control of silicon and manganese is, of course, important, but the use of two grades of blast furnace ferrosilicon (one low and one high in manganese) seems to be both convenient and effective.

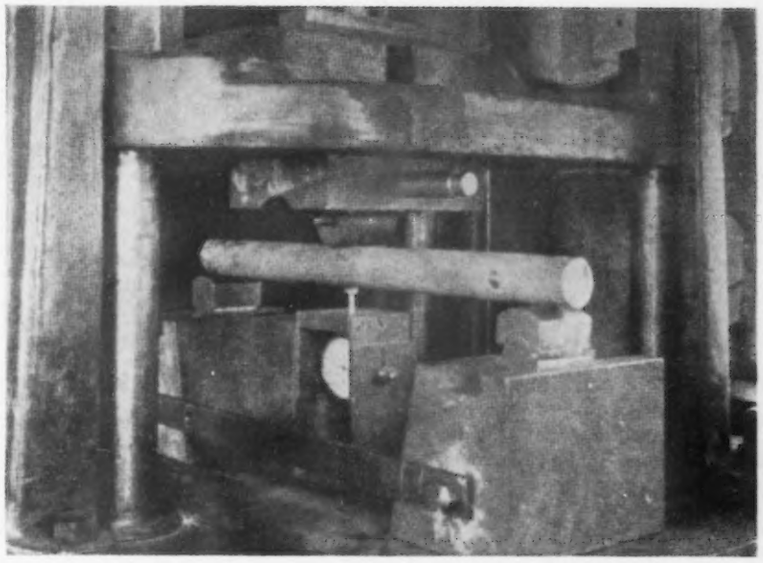


Fig. 1. Method of making transverse test

High Living Standards Attributed To Technological Improvements

THE percentage of the population gainfully employed in the United States increased from 32.4 per cent to 39.8 per cent during the 60 years from 1870 to 1930, while at the same time the total population increased from 38.5 millions to 122.7 millions, or nearly three times, according to a study by the National Industrial Conference Board for the National Machine Tool Builders Association. At the end of this period, which was marked by rapid technological improvements in industry, vast introduction of labor-saving devices, and enormous mechanization of industry, a larger proportion of the total population was employed in producing goods and services than at the beginning, the conference board states.

This study is one of a series being made for the National Machine Tool Builders by the conference board. Upon completion the series is expected to be the first comprehensive survey of mechanization in industry and its effect upon the country from both a social and an economic point of view.

"In 1870 about seven million workers, or more than one-half the total labor force, were engaged in agricultural pursuits," the conference board states. "By 1900 the number of agricultural workers increased to almost 11 million, and has remained practically unchanged since that time. During this 60-year period, however, the proportion of agricultural workers in the total working population has declined steadily, until in 1930 farmers represented only a little more than one-fifth of all workers. The introduction of machinery was primarily responsible for enabling agriculture to dispense with a large proportion of its workers for the benefit of new and growing industries and still to produce a sufficient volume of foodstuffs and agricultural raw materials to supply the domestic demand and for export."

The total number of persons engaged in gainful occupations at the end of 1930 was 42,829,920, or 39.8 per cent of the population, as against 12,505,923, or 32.4 per cent, at the end of 1870, according to the tabulation below.

In conclusion, the conference board points out that the machine made possible the transformation of a nation predominantly dependent upon agriculture into a country with extremely diversified economic interests and high standards of living, utilizing things which were undreamed of or little used at the beginning of the 60-year period, and which are now regarded as necessities.

Persons in Gainful Occupations, Compared with Total Population **Source: United States Bureau of Census**

	Census Years						
	1870	1880	1890	1900	1910	1920	1930
Total population	38,558,371	50,155,783	62,622,250	75,994,575	91,972,266	105,710,620	122,775,046
Persons engaged in gainful occupations.	12,505,923	17,392,099	23,318,183	29,073,933	38,167,336	41,614,248	48,829,920
Per cent engaged in gainful occupations	32.4	34.7	37.2	38.3	41.5	39.4	39.8

Enameling and De-enameling Feature

THE large increase in the sale of washing machines the past few years and the almost universal use at present of machines with porcelain enamel tubs has spurred tub manufacturers to improve the efficiency of their mass production methods and the quality of their workmanship.

An enameling plant largely for enameling washing machine tubs was built by the Youngstown Pressed Steel Co. in 1930 and has been improved in various ways since that time to increase output, to effect greater production economies and to improve the product. This is one of the largest plants in the country for enameling washing machine tubs. It has a capacity for enameling 1800 tubs in 24 hr. Porcelain enamel sinks are a more recent product of this company, for which additional conveyor and other equipment has been installed.

By F. L. PRENTISS

Resident Cleveland Editor, The Iron Age

Not only have production methods been improved but costly losses that result from scrapping work because of defective enamel coatings have been reduced through the salvaging by de-enameling of tubs and sinks having enamel coatings that do not pass inspection.

Operations Are "Conveyorized"

In the press shop tubs are produced in one drawing operation from a circular steel blank. They are then carried on a chain conveyor 5800 ft. long to the pickling room at one end of the enameling plant. Here they either go directly into the pickling tanks or are stacked on the floor. For pickling, the tubs are placed on racks which are handled by an overhead hoist. Standardized pickling methods are followed.

Leaving the pickling department, the tubs move on the racks on a roller track through a gas-heated dryer in which a temperature of 300 to 350 deg. F. is maintained.

The tubs are then hung on an overhead conveyor, on which they are handled during spraying and other operations except burning. First they go to dip tanks for the ground coat, which is a cobalt or blue black coat. Pickling and the

CONTINUOUS U-type enameling furnace for washing machine tubs. The tubs enter the furnace at the left and, after traveling 160 ft. during which the enamel is fired at approximately 1600 deg. F., emerge at the right. On leaving the furnace, the tubs are loaded on racks.

Finishing of Washing Machine Tubs

ground coat work is done by the night shift and the cover coat work is done by the day force. After dipping, the pieces are hung back on the conveyor and pass through a gas-heated dryer for removal of the surplus moisture. Then the tubs are transferred to another chain conveyor on which they loop through a U-type continuous burning furnace. This is a 600-kw. furnace 80 ft. long, and is divided into three zones, one for bringing the tubs up to heat, one for maintaining a fusing temperature and a third a cooling zone. The work remains in the burning furnace about 20 min. Tubs, on leaving the burning furnace, are loaded on large wheel-type racks from which they are hung back on the enameling conveyor line and moved through the spray booths for the cover coat.

THE enameling of pressed washing machine tubs has been developed to a high point of efficiency at the plant of the Youngstown Pressed Steel Co. No less important than improvement in the enameling process is provision for de-enameling defective work. Formerly enameled work with defective coatings had to be scrapped. Now it is reclaimed.

Tubs Rotated While in Spray Booths

There are eight spray booths for tubs and these are arranged in a staggered position, the conveyor looping from booth to booth and making a semi-circular circuit through each booth.

The enameling conveyor line consists of two conveyor chains, each driven. Work is carried in a basket, the top of which is attached to the upper chain and the bottom to the lower chain. The tub is slowly revolved while passing through a spray booth by means of a pinion on the carriage which meshes with the rack attached to the spray booth, making it easy for the gun operator to spray the entire interior and outer surfaces, including the under side of the tubs, without removing them from the basket. The enameling conveyor moves at a speed of 12 ft. per min. Each spray gun operator performs a separate spraying operation on every other tub.

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SPRAYING the cover coat in one of the spray booths. The basket carrying the tub mechanically revolves while passing through the booth, permitting the gun operator to spray all surfaces without removing the tub from its basket.

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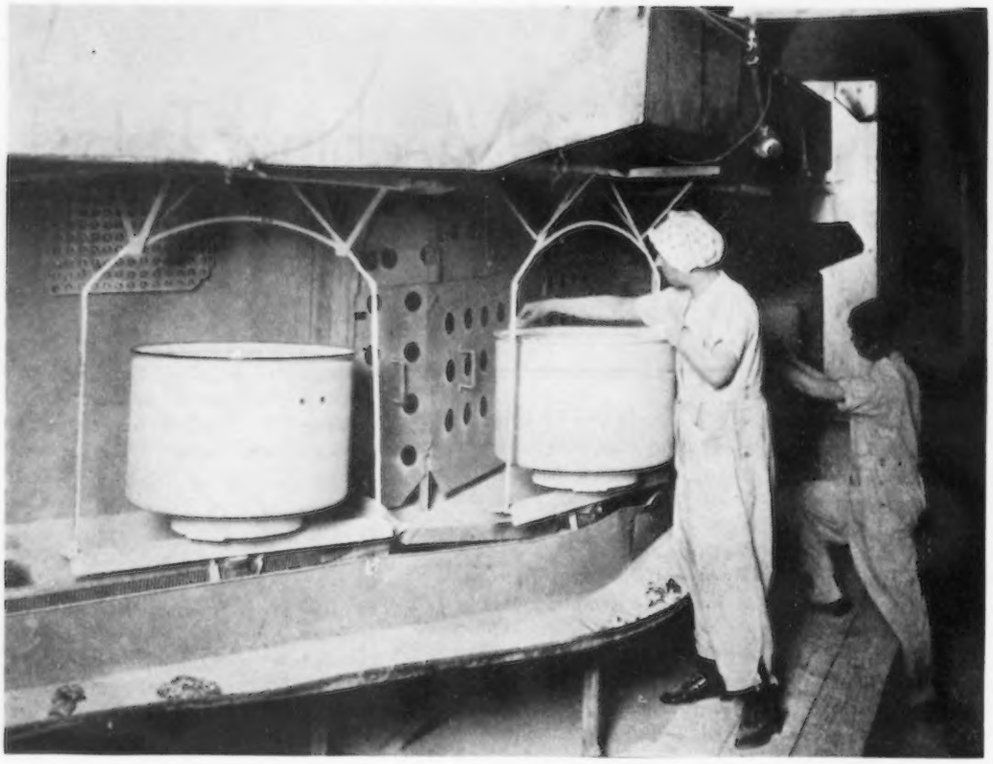
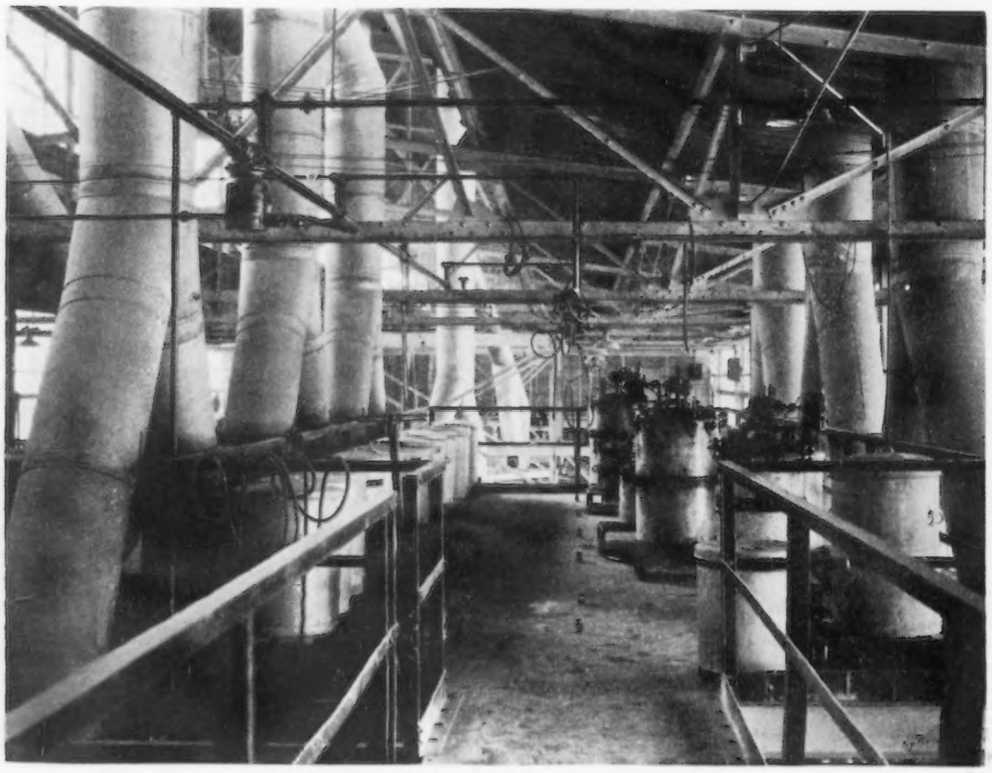


WIPING the cover coat from the curled rim of the tub after drying and before burning.

A labor-saving kink has been adopted in enameling a wringer post hole and a drain hole in the bottom of the tub. As the ground coat is more plastic than the hard finish of the cover coat and provides a better seat for gaskets, it is found desirable to use only the ground coat around the edges of these holes. Instead of wiping off the cover coat around the holes, a wiping plug is inserted in the two holes before the cover coat is applied. Because of the greater plasticity of the ground coat, making it less liable to chip, the rim is given only this coat. In this case the cover coat is wiped from the rim. This blue black coat makes a pleasing color combination with the lighter colors used in the tubs.



MEZZANINE floor over the spray booths. Enamel is fed from the tanks by gravity to the spraying equipment below.

After spraying, the tubs go through the dryer, are wiped and an air blast is applied to the interior to blow out any dust that may have accumulated on the surface. Then they go to the continuous enameling furnace. When additional cover coats are applied the operations are repeated.

The completed tubs go to an inspection table, are packed and moved on a gravity conveyor from which they pass on to a power-driven conveyor which takes them to a carloading platform and storage room.

Separate Conveyor for Sinks

A separate conveyor line and six spray booths have been provided for sinks. After being sprayed, they are hung on the sink conveyor which carries them through the dryer and then down the length of the plant to a burning furnace. This is a gas-fired, box-type furnace located at the side of the continuous furnace. Work is charged into the furnace on two forks. While one load is being fused in the furnace the other fork is being unloaded and reloaded.

Sinks, and also combination sinks and laundry tray covers, are given the ground coat and two cover coats and in addition an acid-resisting coat of enamel.

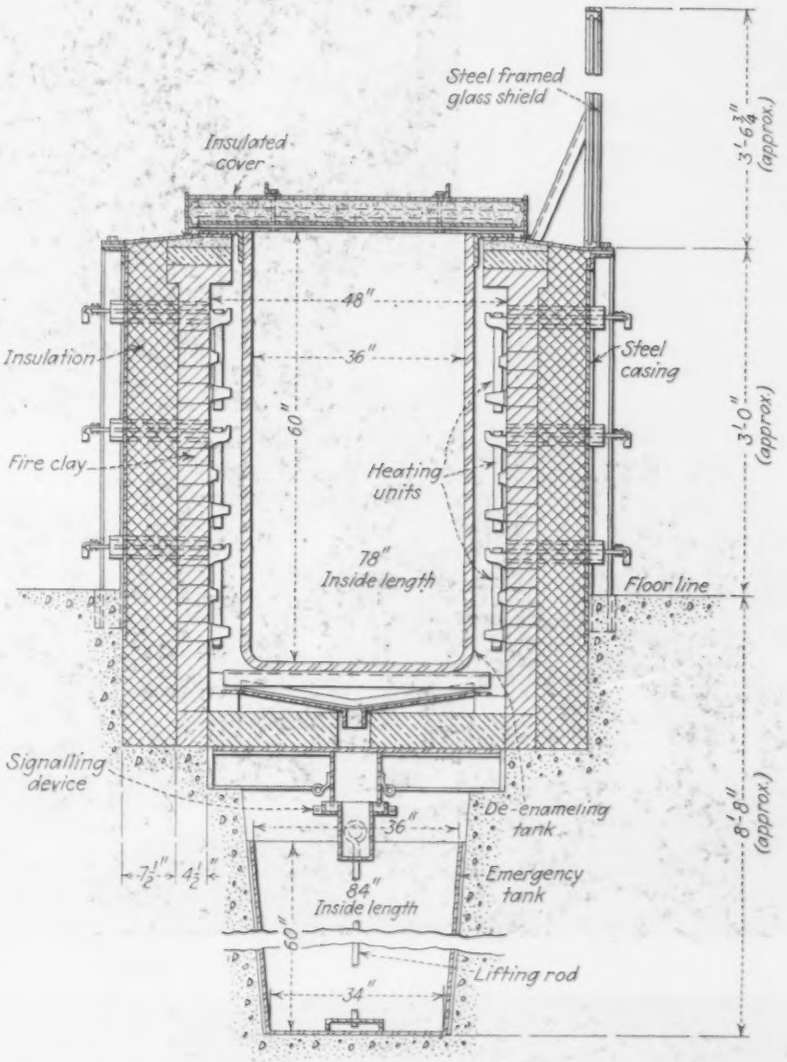
Enameling Materials Fed by Gravity to Spray Guns

Enameling materials are stored on a balcony directly above the grinding room and are dumped through hoppers into four ball-type grinding mills. The material is drawn from the mills into containers and filtered through a fine screen vibrator. Then it goes through a magnetic separator for the removal of metallic particles. Sample panels are sprayed and baked to determine whether the material meets color specifications. After this checking, it is dumped in cans on a floor above the enameling room, one above each booth, and is fed by gravity to the nozzle of the spray guns.

Reclaim Defective Enameled Parts

The reclaiming of defective enameled parts has been one of the problems of the porcelain enameling industry, as losses due to poor enameling and chipping in assembling and handling are heavy. Some attempts to salvage the parts by de-enameling have not proved satisfactory because of the high cost or length of time required in removing the enamel. In some cases acids have been used for this purpose, but have proved unsatisfactory, as in addition to removing the enamel they have eaten into the metal base. Parts having defective enamel coatings are commonly junked because they have no value even as scrap unless the enamel is removed.

A de-enameling furnace and process which are now being successfully used for de-enameling defective porcelain enamel parts have been developed by the General Electric Co. and are used in that company's electric refrigerating plant in Erie, Pa. This process and the General Electric de-enameling furnace are now used in a de-enameling plant recently installed in connection with the Youngstown Pressed Steel Co.'s enameling plant. With this process removal of the enamel is rapid and economical. The plant is located in a building adjoining the enameling department.



SECTIONAL view of electric de-enameling furnace. Porcelain enamel is removed from defective parts by immersing them in an alkaline bath, the heating units for which are located on the side walls of the furnace adjoining the outside of the tank.

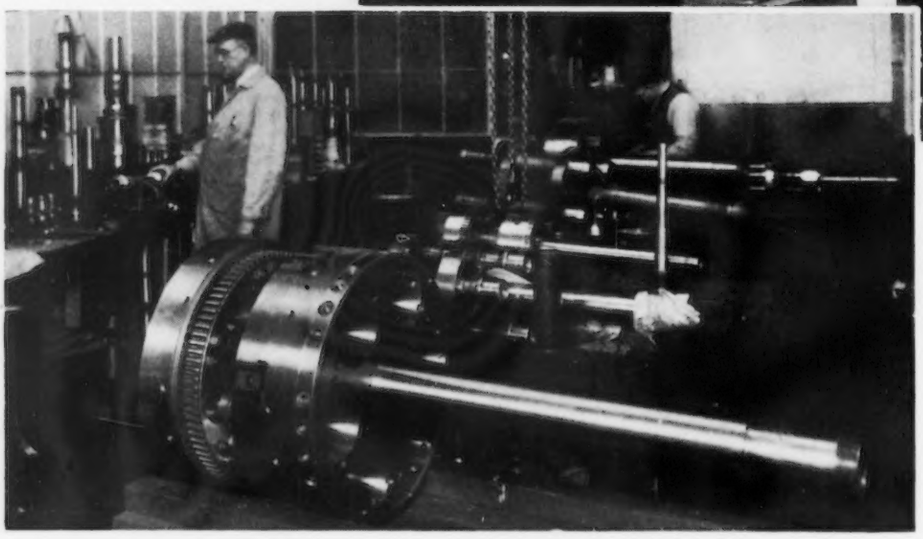
The porcelain enamel is removed in an alkaline bath of molten sodium hydroxide. The furnace is electrically heated and electrically controlled. The tank containing the bath is set in the heating chamber, and the heating units, consisting of strips of nickel-chromium alloy steel, are mounted in sinuous loops on the side walls of the heating chamber adjoining the outer surface of the tank.

(CONTINUED ON PAGE 74)

With the Assemblers in a Plant

BELOW

FIG. 2.—Illustrates sub-assembly space layout for the mounting of spindles with tapered roller bearings in the spindle carrier. The indexing gear attached to the six-spindle carrier in the foreground is a split member and is assembled after all finishing operations upon it have been completed.



ABOVE

FIG. 1.—Showing type and arrangement of benches and the wood-block flooring used because of its non-fatiguing qualities. The department is housed in a one-story, saw-tooth structure which provides ideal light conditions.

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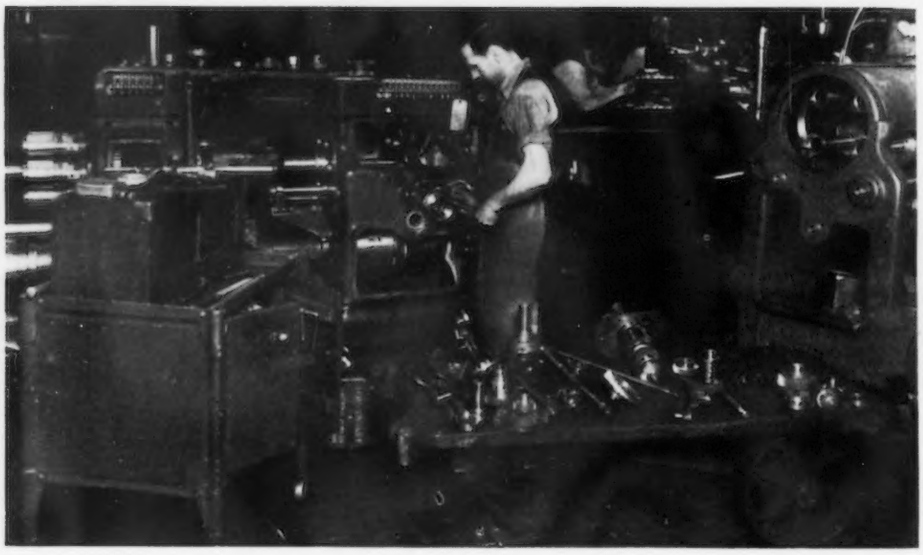


AT LEFT

FIG. 3.—Demonstrates the utility of the portable tool cabinet with which each floor assembler is provided. The type of truck employed in supply parts transportation is shown.

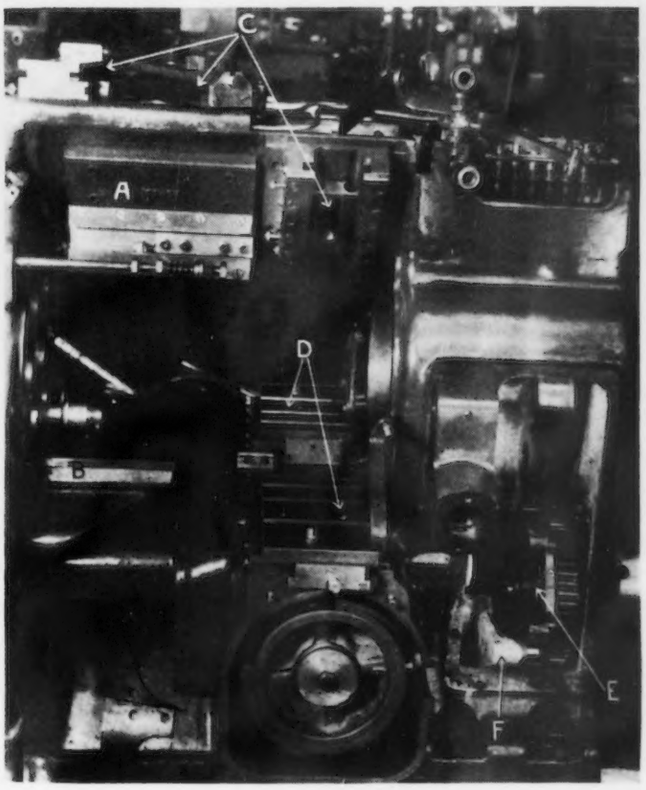
Devoted to Production Problems

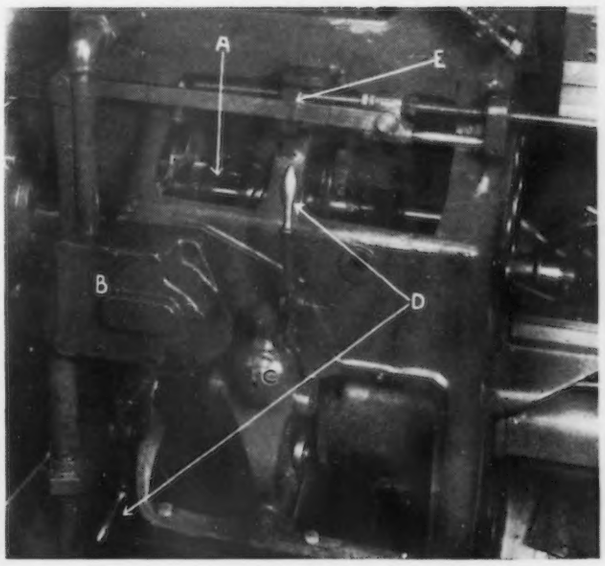
ILLUSTRATING actual assembly of Acme-Gridley automatic screw machines at the National-Acme Co. plant in Cleveland.

Sub-assemblies at the bench, for simplifying the work of floor assembly, employ some 80 men.

Bench assemblies include among other units, tool slides, transmission with gears and clutches, coolant pumps, spindles and spindle carriers, cam lever mechanisms, drilling and tapping attachments, etc.

A foreman, an assistant foreman and a department clerk exercise supervisory department control in carrying out the details of assembly procedure in connection with the manufacturing schedule of machine lots.





ABOVE

FIG. 4.—Presents the completed installation of several sub-assemblies. A—Part of transmission. B—Coolant pump. C—Transmission brake. D—Transmission hand levers. E—Operating throw for threading attachment.

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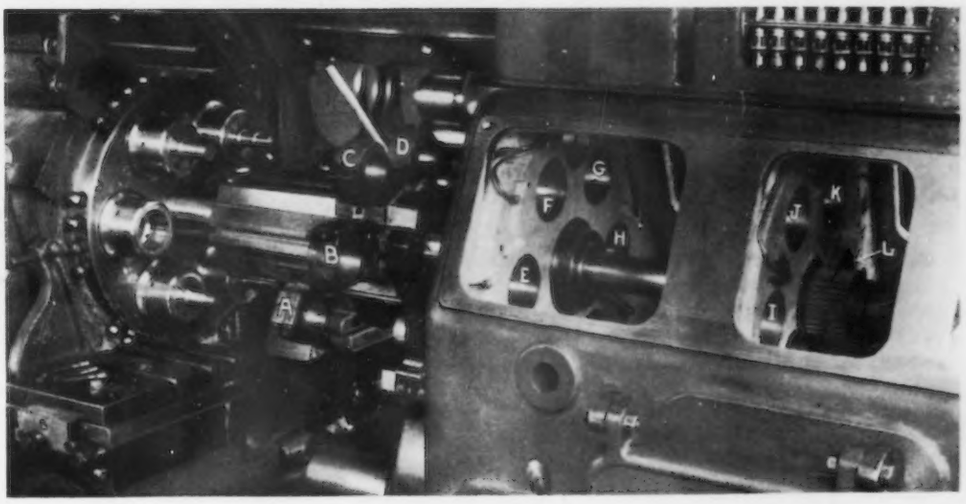
AT LEFT

FIG. 5.—Other important sub-assemblies are being installed. A—Threading attachment, fitted to line accurately with the spindles. B—Tool slide guide block, doweled and held by socket-head cap screws. C—Upper tool slides. D—Lower tool slides have hardened steel support-strips which are scraped to supporting surfaces of the spindle carrier housing. E—Spindle carrier indexing assembly. F—Indexing lever assembly. E and F assemblies are shown in relation to each other but are not in operating position.

AT RIGHT

FIG. 6.—*A-B-C-D* are four of the six tool holders which are bored with a single point tool held in the spindle chucks; *E-F-G-H*, etc., to six holes in the machine head, are bored by a bar held in the spindles and piloted by the *A-B-C-D*, etc., tool holders; *I-J-K-L*, etc., to six holes, are bored with the boring bar piloted by *E-F-G-H*, etc; *E* to *L*, etc., up to six holes in each member, are for positioning end tools or attachments.



Rural Industrial Location Cushions Shock of Depression

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By R. C. TAFT

Manager, Batcheller Works, American Fork & Hoe Co., Wallingford, Vt., As told to Francis A. Westbrook, M.E.

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THE town of Wallingford, Vt., is a small one located in a valley in the Green Mountains. There is considerable farm land surrounding it which is suitable for subsistence farming, if not for agricultural production on a large scale. The factory of the American Fork & Hoe Co. employs about 125 workers normally, and it is the only one in the village except for a clothes pin factory which employs only about 10 men. The American Fork & Hoe Co. plant has been in Wallingford for well over 100 years, having started as a blacksmith shop. In this shop the original owners made pitchforks by hand, and now the present plant makes all sorts of hand agricultural tools by the most modern machinery and methods.

There are a good many decentralized industries in New England and elsewhere, but none has made a greater effort to take full advantage of its rural environment, especially from the standpoint of its employee relations. In order to have it clearly in mind, let us briefly summarize the advantages which are supposed to accrue from locating a manufacturing plant in a small town, and then compare them with our actual experience. The advantages include, among other things, better living conditions for the workers, the possibility of their owning their own homes and of having land to cultivate, and so on. On the whole, the workers are supposed to have a greater degree of economic security.

In order to retain and develop the class of workers which we need we feel that an important duty of the management is to handle its employee relations in such a manner that they will not lose their personal initiative to an extent which will make it impossible for them to embrace the advantages which living and working in the country hold out for them. This is particularly necessary because standardization, although an essential of good modern industrial management, is also one of its weaknesses, in that it deprives the workers of as much opportunity to think for themselves as the management can devise. The habits which they thus acquire in the factory are very likely to extend into their private daily lives and render them more or less helpless when they have to deal with unaccustomed situations, such as those resulting from the depression.

Intermittent Operations Stimulate Employee's Initiative

Our business has a seasonal character with slack seasons which have been greatly aggravated by the depression, and we have had to shorten our hours and close down entirely at times for certain days in the week. During much of the depression, also, it has not been possible to give enough employment for the workers to live on. All this tends to throw our people on their own resources to a very considerable extent, and we feel a very definite responsibility for doing as much as practicable to guide them into a useful employment of their leisure time.

It is obvious that in our rural setting here a man of average intelligence and a reasonable amount of aggressiveness can do a good many things with the leisure time which is forced upon him, which can be of real benefit to himself and his family. But first he must overcome certain habits acquired when work was steady and well paid. For instance, most of the workers had cars which they used freely and they bought their fuel and food.

Management Encouraged Spare Time Work

With their enforced leisure they had time to go into the nearby forests and cut their own supply of fire wood in winter and to grow a substantial portion of their yearly food supply during the summer. They also had to learn to refrain from using their cars so much.

The opportunities for self-help in the way of securing fuel and food are right at hand in this decentralized situation. The thing was to get the men to realize this. The management therefore took definite measures toward such an end. In the first place, in scheduling its production and assigning work to its employees, it was planned that each man, especially a head of a family, should get his share of the available work so as to have some ready cash for things that had to be purchased. In the second place production was sched-

uled in so far as possible so that the longest slack period would come in the summer.

This was for two reasons. The first was that many men could find temporary work during the haying season on some of the dairy farms in the neighborhood. Others had opportunities to take part in the road work, of which there is always more or less going on. And secondly all of them could work in their vegetable gardens. Many of the workers owned their homes and a fair proportion of them had land which they could farm on a small scale, at least to the extent of keeping a cow, some chickens and perhaps a pig.

Where a concern has been in the same small town for so long many of the workers, in fact most of them in this case, come from families which have lived there for generations and have become firmly established in homes which they own and have developed. This of course means a low labor turnover and a very substantial class of people, which all employers are bound to set great value by. Thus by closing the plant entirely during the summer months and operating in the winter the men are given a chance to work on their land. So far as the land owners are concerned no problem is involved in getting them to do this. They naturally turn to their land when they have nothing else to do.

There is, however, a considerable group who live in rented houses in the village and it was felt that they needed some stimulant to make use of their spare time to produce part of their food supply. This was done in a very simple way.

Garden Club Started

A garden club was organized and use of land was given by some of the executives of the company. Membership in the club was open to all employees and executives. Each made a contribution in money or an equivalent amount of work in the garden. The money was used to buy seeds and fertilizer. During the growing season the members cultivated the garden and each was credited with the amount of work he put in. A canning outfit was installed in one of the factory buildings and large quantities of vegetables were canned. The man who ran the canning end of it was credited with work on the same basis as those who hoed the garden, and so was the timekeeper. Everything was carried out on a strictly businesslike basis.

At the end of the season many of the families had a full supply of vegetables for the coming winter and they had been living off the garden all summer. This experiment was a great success, we felt, as it was carried out with enthusiasm by the members of the club after the company got it started.

We did not sponsor it another year. The object of doing it once was to demonstrate the advantages of making use of leisure time in this way, and we felt that a practical example was worth any amount of talking. The second summer since our experiment now approaches, and already, in March, there is considerable activity among the employees, some of them girls, in getting ready and planning for their gardens. The same was true of the previous summer. In other words, when the workers were once given the idea, they carried it on themselves on their own initiative, which is exactly what we hoped should be the result. Although the company is out of it, so far as sponsoring the garden is concerned, it gives any assistance that it is asked for and which it can reasonably render. For instance, some of the executives loan land which is suitable for cultivation, and the canning outfit is loaned by the company.

SEVERAL of the modern trends in manufacturing organization and procedure are well exemplified by the experience of the American Fork & Hoe Co. at its plant in Wallingford, Vt. This relates especially to the advantages of its decentralized location, and the manner in which it has been possible to take care of its employees during the depression.

There has, of course, been a great deal of talk about decentralizing industry and much has been written on the subject. Here we have an example of a going concern which has weathered the depression successfully, and in such a manner that even in a one-industry town it has not been necessary to have a relief committee.

It is felt that this would not have been possible, and certainly it would at least have been a great deal more difficult, if the plant had been located in an industrial center. And it is also felt that what has been accomplished in this particular instance may be of interest and value to managements that are thinking of moving into a rural environment.

Provide Own Wood Supply in Winter

As regards the winter season, we have also tried to schedule production when running on only part time so that there will either be a period of weeks when no work is done, or some consecutive days per week when each man is laid off. This is so that he can have time to cut his own wood supply.

Of course many of the workers, in fact most of them, do not own wood lots, but there are people in the village who own them but for one reason or another do not do their own chopping. Consequently it is possible for the men to cut wood for these people and pay for what they take by supplying the owners with their wood supply. Trucking the cord wood down from the mountains is often paid for by wood for the trucker.

Thus it will be seen that barter enters into the economic life of a decentralized factory much more readily than would be possible in an industrial center. In fact this has been carried a good deal farther, especially with the proceeds of the gardens where, for instance, a man with a surplus of some one or more products trades it for something that he is in need of, either in the form of vegetables, meat, labor, or other goods.

The company secures a good deal of the wood for the handles of its products locally. As much of the cutting and hauling of this as possible is scheduled for the winter and this gives employment to a good many men who would otherwise be out of work or on part time, thus providing an additional remunerative occupation for spare time during slack periods in the shop.

As most of the workers are me-

(CONTINUED ON PAGE 75)

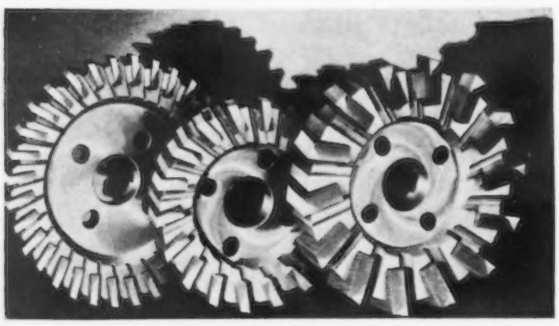
Improvements in Production

New Cutter Blade Locking Method Eliminates Auxiliary Parts

ZEE-LOCK cutter blades are announced by the Ingersoll Milling Machine Co., Rockford, Ill. The close-up illustration below is of the blade securely retained in the cutter housing by a zee-shaped wedge; the wedge hooks the front of the cutter body and the back of the blade. It is impossible for the blade to shift backward or inward away from the cut. The back hook of the wedge is on an angle, so that when the blade is reinserted and moved out one serration it moves forward a slight amount, compensating for the slight amount of face wear. It should be noted that the main adjustment is outwardly or radially with the main wear, as a cutter always wears in the direction of feed. No accessory parts are required for resetting. The blade adjusts itself automatically in the proper proportional directions of wear. The wedge is the locking member and is not disturbed by the thrust of the cut, which is absorbed by the serrations. The serrations further increase the area of frictional contact for locking.

The design is for application to many kinds of cutting tools. The illustration shows the range of Ingersoll face mills made with the zee-lock cutter blade. Medium-duty cutters, using a blade $\frac{3}{8}$ in. thick, with a blade spacing of about 1 in., are used for medium or finishing operations. The so-called heavy-duty cutter, with a blade spacing of $1\frac{1}{2}$ in. to $1\frac{3}{4}$ in., using blades $\frac{1}{2}$ in. thick, suffices for a general-purpose cutter. For the heaviest of milling operations an extra heavy-duty cutter with blades $\frac{3}{4}$ in. thick and spaced about 3 in. apart is made. Cutter bodies are made with the national standard planer or flange nose drive, or to fit any milling machine or horizontal boring mill.

Zee-lock cutter blades are of special selected forged high-speed steel, super-cobalt high-speed steel, J metal stellite, or are tipped with cemented carbide. The blade is adapted for carbide cutters, as it is well backed and there is no hammering on the blade when locking, and it is rigidly locked. The cutter housings are of forged and heat-treated chrome-molybdenum alloy steel.



THE cutter blade is securely retained in the cutter housing of this milling cutter by a zee-shaped wedge which hooks both the cutter body and the blade.

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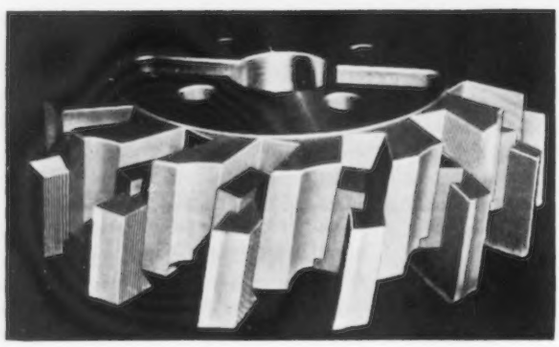
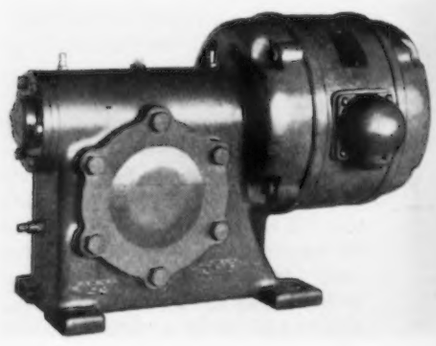
Motorized Reducers of Worm Gear Type

MOTORIZED worm-gear speed reducers, illustrated below, are now being manufactured by D. O. James Mfg. Co., 1120 West Monroe Street, Chicago. These units are available in horsepower ratings from $\frac{1}{2}$ to $7\frac{1}{2}$. Standard speeds of output shafts range from 290 to 26 r.p.m. Efficiencies of the smaller units are as high as 94 per cent.

These reducers are of the heavy-duty type. Worms are made integral with the shaft and are of chrome-nickel steel, case hardened and with ground threads. Gears are of alloy bronze. The worm shaft is mounted on double Timken roller bearings. Ball bearings are employed to absorb radial and end



THESE speed reduction units are available in $\frac{1}{2}$ to $7\frac{1}{2}$ hp. ratings. Anti-friction mountings are used throughout. Standard motors are employed.



and Shop Equipment . . .

thrust loads. Gear shafts are of alloy steel, ground, and over-dimensioned to withstand starting and overload strains. The gear shaft is supported on Timken roller bearings. Overheating is provided against by a large heat radiating and oil cooling space in the housing. An oil level cock prevents over-oiling. Motors are of standard squirrel-cage type, normal torque, 2 or 3 phase, 60 cycle. The ½-hp. motors can be furnished for 110 or 220 volts, the ¾ and 1-hp. units in 110, 220 or 440 volts, and 1½-hp. and larger can be furnished in 220 or 440 volts.

Small Paint Sprayer For Flat Covering

A SMALL sprayer with cup attached, without a needle and having a flat spray, is featured in the "Duquesne" model machine manufactured by the O. Hommel Co., 209 Fourth Avenue, Pittsburgh. A special nozzle flattens out the spray, enabling it to cover large areas evenly.

The new model combines the best features of two other "Hommel" machines; a short-nosed nozzle is employed, as is also the comfortable pistol grip.

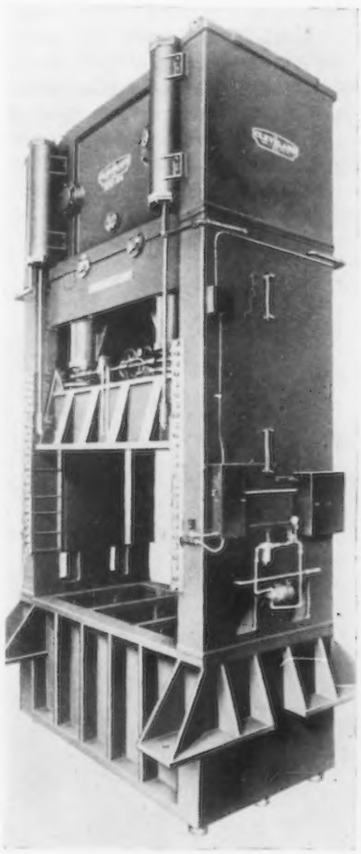
The new machine is designed for heavy liquids such as lacquers, enamels, glazes, bronzes and like materials and for covering large surfaces quickly.

A regulator on top of the supply tube accurately controls the spray volume. Adjustment is simple, and once set, the flow of material will remain constant and even. The reservoir is easily cleaned by removing the regulator.

The "Duquesne" is made of solid brass, heavily nickel-plated, has no soldered joints, and is finished with coupling at the hose end for convenient hose attachment at any shop location.

Huge High-Speed Forming Press Of Welded Plate Construction

CLEVELAND PUNCH & SHEAR WORKS CO., Cleveland, employs welded plate construction in the building of large presses. Illustrated below is a press used for body panel work and weighing approximately 225,000 lb. The height is 30 ft. The specified capacity is 500 tons pressure at the beginning of the draw. The bed measures 80 x 124 in., and has bed openings 60 in. and 118 in. The ram is 80 x 116 in., the stroke is 24 in., adjustment 32 in. Maximum height is 56 in.



FOUR-POINT slide suspension is employed in the design of this huge press which has 500-ton pressure capacity at the beginning of the draw.

Four-point suspension is employed to prevent tilting of the slide, desirable where there is an uneven pressure on the dies. The slide is provided with four massive adjusting screws of barrel type. These are connected by an interlocking gear system whereby their functioning is coordinated. This power-adjusting mechanism is controlled and operated by one of three push-button controls and is designed to prevent misoperation of the press; adjustment cannot be made while the locking motor is set nor can the press be operated until the locking motor is set. Two other push-button controls are used in operating the press and in adjusting the ram.

The press has a speed of eight strokes per min. and is provided with a 30-hp. high-torque motor. Multiple V-belts are employed to drive the flywheel which is equipped with a multiple-disk air clutch and brake. In operation the drive pinion engages with the two intermediate gears, which in turn operate the four main shafts. An important feature of this design is that it constitutes a balanced drive to all four points of the slide.

The housings are constructed of standard rolled shapes and flat plates electrically welded, and the press is provided with six massive steel tie rods, three in each housing, shrunk into place.

Four long gray-iron gibs, designed with stiffening ribs, serve as guides for the ram. Ample provision is made for adjustment by means of bolts and adjusting screws.

The driving gears are lubricated by a force-feed system which sprays the gears, the oil being returned continuously by gravity to a tank located in one of the housings.

New Band Saw Machine For Internal Sawing

AN open-end band saw, for internal sawing in the manufacture of tools and dies, is being placed on the market by Grob Brothers, West Allis, Wis. The equipment is illustrated below. Cutting is accomplished by a toothed band, 150 ft. long, helically wound over a drum and

hooked over three guide sheaves. Mechanism is included for forward motion at cutting speeds and reverse motion at high speed, with facilities for proper tensioning. Fastened to the base of the machine are a rugged box arm casting carrying a loader sheave and two saw guide sheaves, a support bracket on which the table and a third saw guide sheave are mounted, and two bearing brackets supporting the drum. The drum is mounted on a threaded spindle so that, when revolving, it screws itself back and forth, winding and unwinding the band. The drum is tapered to compensate for the band being heavier on the front or toothed side. A small guide wheel, covered with rubberized fabric, holds the band tight to the drum when tension is released.

The bands used are 0.025 in. thick, ⅛, 3/16 or ¼ in. wide and 150 ft. long. It is wound on to the drum by means of a removable loader sheave, on which it is first coiled. The front end is looped over the guide sheaves and reattached to the drum. The tensioning method employed is described as follows: Since the drum must be tapered, the length of the band loop will vary several inches during its forward and reverse motion. The guide sheaves directly below and above the work support have stationary mounting. The sheave above the drum has a hinged lever mounting. A long extension spring is fastened to the base of the machine and to the hinged lever mounting. This provides equal spring tension over the entire travel of the lever.

For die sawing it is only necessary to release the band tension by a single lever movement, remove the front end of the band, which is fastened to the drum with a self-tightening eccentric clamp, and insert it through the opening in the die. It is then reconnected to the drum and tension applied. Time required is about 30 sec. Three minutes of sawing can be accomplished at slow speed; when the band end is reached, 18 sec. is required for the return of the band to position for another 3 min. of sawing.

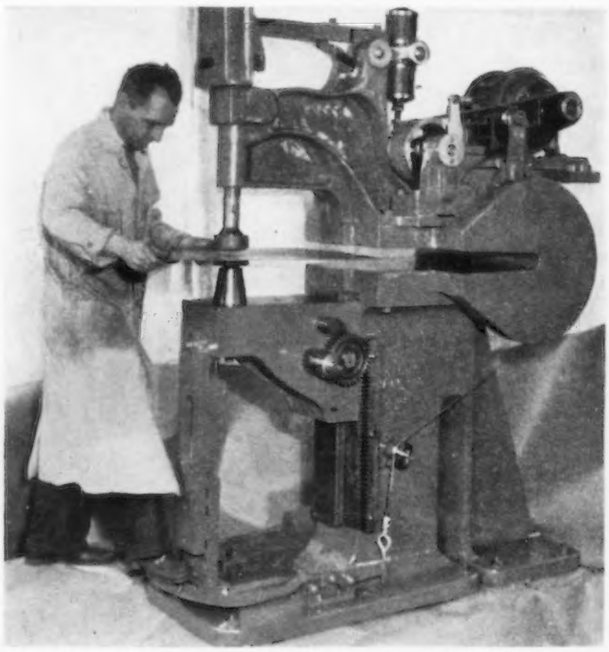
All revolving parts are made of aluminum. Positive stop is by means of a limit switch and a drum brake; the operation is completely electrical. Push buttons are conveniently placed; drum control for various speeds and automatic reversing is at the left of the base. Two motors are employed, variable speed for the forward and single speed for the reverse motion. Mutiple V-belts are used. The table is 24 x 28 in., and is tiltable in two directions. The throat is 25½ in. and material up to 9 in. in height can be sawed.

The machine has four cutting speeds, 50, 75, 100 and 150 ft. per min. of band travel; reverse speed of band is 500 ft. per min. Machine height 74 in., weight 2000 lb.

Special Hammer for Flattening Butt Welds

TRIMMED butt welds on sheets of No. 20 gage steel used in the manufacture of automobile bodies are being flattened at the rate of 70 in. per min. on special machines recently built by the High Speed Hammer Co., Inc., 305-321 Norton Street, Rochester, N. Y. The equipment is shown below.

On these sheets the riser, which has been trimmed, averages about 0.004 in. per side. The hammering operation quickly reduces this thickness to the gage of the metal. Production time depends on the amount of material left for flattening after the trimming operation, the gage of the sheet, hard-



ness of the sheet and of the weld.

Two flat sheets are butt-welded together, and the flash is removed by a standard flash trimming machine, after which the sheet is given a uniform thickness throughout by one of the high-speed hammering machines. The welded sheets are then stamped and formed without any danger of the weld opening or fracturing. Finishing, priming and painting operations are carried out without the need of soldering, filling, filing, or similar preliminary operations.

The hammers are built with gap to accommodate various widths of sheets. The handling of the large welded sheets is facilitated through the use of roller tables or ball transfers constructed on each side of the machines.

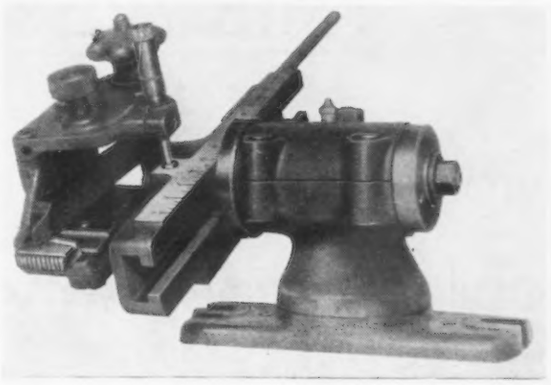
Attachment for Tap Chaser Throat Grinding

FOR use in regrinding the throat or chamfer on Landis collapsible tap chasers, the Landis Machine Co., Waynesboro, Pa., has placed on the market the tap chaser throat grinding attachment illustrated below.

The base of the attachment is arranged for bolting to the table of many standard makes of tool and cutter grinding machines. Attached to the base is a swivel base which carries the spindle to which is attached the vise base for holding the chasers. The vise base is adjustable for setting the chasers on a radius corresponding with that of the thread which they are to cut and is graduated for diameters from 1 in. to 13½ in. It is also fitted with a micrometer for obtaining the desired amount of radial clearance with which the chasers should be ground.

The vise base is provided with a milled flat which will accommodate all sizes of tap chasers manufactured by the Landis Machine Co. The individual chasers are held by an adjustable clamp and locked with a hand screw. The vise base rotates with the spindle, which is fitted in a capped bearing, to provide an oscillating movement for grinding the chaser against the face of a cup-shaped wheel. To facilitate this movement a handle is fitted to the vise base. This motion will produce a radial clearance on the chaser throat.

The attachment is suitable for grinding all sizes of chasers used in Landis style LT and style LM taps as well as chasers used in the Victor collapsible taps, previously manufactured by the company, up to and including 12 in.



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THE base of this tap throat grinding attachment is designed to permit of attachment use with many of the standard makes of tool and cutter grinders.

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Adjustable Valve for Air Piston Idle Stroke

ROSS OPERATING VALVE CO., 6484 Epworth Boulevard, Detroit, announces the two-pressure operating valve illustrated below.

Pressure for the idling-stroke of a piston is selected through an adjustment after the valve is installed. This adjustment is independent of pressure for the work-stroke of the piston and can be regulated from zero to full line pressure. The built-in reducing valve is so designed, that pressure reduction is accomplished in one supply chamber only, and without choking or throttling the exhaust. Adjustment is made by removal of a cap from a hublike projection at the side of the housing.

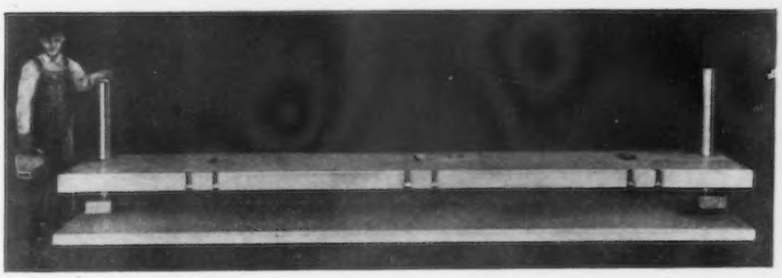
Large Die Set

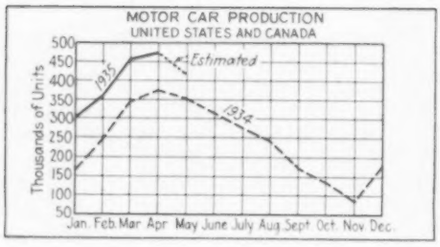
THIS die set, for automotive frames, torch-cut and welded from steel plate, is built by Danly Machine Specialties, Inc., Chicago.

Dimensions are 24 in. wide, 192 in. long, and 16 ft. over all; weight, 10,900 lb.

The steel bosses are screwed and doweled in place and carry bronze bushings 4 in. I.D. and 10 in. long. The guide posts are 4 in. diameter x 45 in. long, and are hardened and ground.

The shoe thickness is 3 in. and holder 5¼ in.





THIS WEEK ON THE

Chevrolet Strike at Toledo Settled; Automobile Assemblies Again Speeded

DETROIT, May 14.

THE Chevrolet strike at Toledo which has been a first-class headache to everybody concerned was terminated by a two to one vote of the members of the local American Federation of Labor union in a stormy session Monday night. It is expected that the transmission plant, which has been closed since April 23, will be reopened on Wednesday.

In the final stage of the strike, a lively tussle developed between Francis J. Dillon, chief A. F. of L. organizer in the automotive industry, and leaders of the Chevrolet local union for control of the situation. The former threw the strength of the national organization behind the settlement agreed upon by officials of General Motors and the Federation in a prolonged conference on Saturday. It was said that if the local union voted against the settlement it faced immediate suspension by the national body. In fact, at the start of the strikers' meeting Monday night, Mr. Dillon was excluded and announced heatedly that the Chevrolet local was suspended, later apparently retracting his decision when he was invited to present his views.

Terms of the agreement indicate that the Federation won little as a result of the strike. Employees are to get a wage increase of 4 cents an hour, or slightly more than the amount originally offered by Chevrolet. An hour's pay will be allowed any employee who reports for work but is sent home because of lack of materials. This provision already is in force in some General Motors plants. Wage rates which have been out of line are to be readjusted upward. The Federation is given the right to represent its own members in collective bargaining with the management but non-union employees also have the right to bargain through their own representatives.

The point is that the Federation did not get the written contract which it sought, and the terms generally differ little from those originally proposed by Chevrolet. In fact, the local union leaders put up a stiff fight against ratification of the agreement because they thought that the concessions made by General Motors were too mild.

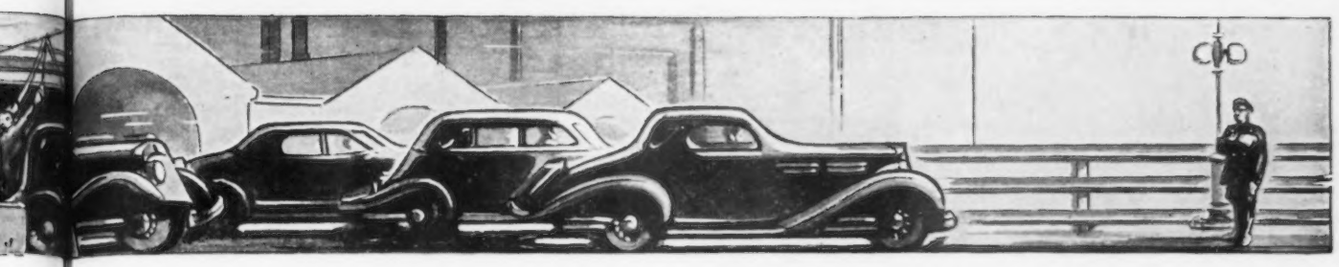
The A. F. of L. did salvage something out of the Toledo mess. It appears that it has maneuvered its sworn enemy the Automobile Labor Board into a position of impotence where its usefulness is permanently impaired. The Federation, having injured the ALB'S prestige by keeping it out of the Toledo strike situation has added insult by calling a strike at Hupmobile in case the board tries to go through with its plans for holding a plant election there. It is a disconcerting fact that the Federation seems to be in a position to carry out successfully its threat since it won a complete victory in a recent strike at the Hupp factory.

Both Sides Embarrassed

A rapid succession of events in the Toledo strike has been embarrassing to both sides. General Motors, at the beginning of the strike announced it wouldn't negotiate with the men until they returned to work but in less than a week its officials were negotiating and the men still were out. General Motors insisted on a vote among all employees at Toledo on its offer for a settlement of the dispute prior to the strike and received a rude and unexpected jolt when the poll was two to one in favor of rejecting the terms. On its side the Federation has been wrestling with a rank and file movement in its Chevrolet union at Toledo which precipitated the strike in the first place against President Green's advice, and which has been hard to control.

Everyone has lost financially during the strike. It will take Chevrolet workers months to get back even at increased hourly rates what they have lost in wages during the past three weeks, not to mention the loss in income sustained by thousands in other Chevrolet plants and in outside factories supplying Chevrolet materials and parts. It is generally conceded that Chevrolet itself cannot recover this season from the effects of the paralysis which crept over its productive system during the strike. Ford, already with a whopping lead, has been given a further advantage which cannot be overcome this year.

Various Chevrolet plants are expected to resume work as the manufacture of transmissions begins again and steel and parts releases in substantial volume from Chevrolet and Fisher body are looked for today and tomorrow. While there will be some rebound in automotive production because of the termination of the Toledo strike, the year's peak is over and no sizable hump in the car assem-



ASSEMBLY LINE

bly curve looms ahead. The May total depends almost solely on what Chevrolet's output will be and at this time even Chevrolet's officials probably can't do more than make a guess. It admittedly will take time for Chevrolet to get into the production swing again.

Resumption of work at Toledo does not alter the program for building transmissions at Muncie, Ind., and at Flint, Mich. The Buick local of the A. F. of L., which threatened a sympathetic strike this week in defiance of orders from Mr. Dillon, apparently has decided to refrain from walking out. It is believed that the clearing of the labor air at Toledo is likely to extend to Flint.

Steel releases from both Ford and Chrysler the past week were larger than anticipated, the explanation possibly being that they have enjoyed some business which if the strike hadn't interfered would have gone to Chevrolet. Ford still has 150,000 to 160,000 cars and trucks scheduled for May and 125,000 for June. All Chrysler divisions are stepping along at or near full capacity with the total this month likely to be close to the 89,000 units made in April. Hudson is reported building around 10,000 cars this month.

Strike Costing $450,000 A Day

While Chevrolet's loss of production is said to be costing General Motors around $450,000 a day, other divisions have been sweeping ahead at undiminished speed. Pontiac, getting all the transmissions it needs from Buick, has been building 850 to 900 cars a day and two days the past week exceeded the 1000 mark. It should make about 19,000 cars this month. The management is understood to be undecided when to terminate operations on 1935 models. The production run will be pretty well cleaned up by Aug. 1, although there is a possibility that 6000 or 7000 cars will come off the lines in the fore part of August.

BY BURNHAM FINNEY

Detroit Editor, The Iron Age

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It is not improbable that Pontiac will build a few 1936 cars during August and surely will be well launched on its next year's manufacturing program in September, although its models won't be announced until around the time of the New York show, which starts Nov. 2. It is a reasonable assumption that other General Motors divisions will not deviate much from the course planned by Pontiac, so far as the time element is concerned. High officials of the corporation are said to be smarting from the sales jump which Chrysler as well as Ford got early this year and are determined that dealers will have ample stocks of cars at show time in November.

Chrysler Off to Flying Start

Chrysler got off to a flying start on 1935 models, with substantial production under way last December although formal introductions were held in abeyance until about Jan. 1. The important point is that Chrysler has never been headed off, despite predictions to that effect since the middle of March. Lately, of course, it has been benefiting partly at Chevrolet's expense. This lesson hasn't been lost on General Motors, whose highest officials have pledged to dealers that 1936 won't see a repetition of 1935 and 1934. All the delay early this year, incidentally, didn't occur in the Chevrolet organization. Pontiac and Olds dealers lost some orders because they couldn't get cars. Both divisions, however, have done an amazing business. Thus far this year Pontiac has made around 80,000 cars and Oldsmobile 75,000. The latter jumped the customary sales traces last month and broke all records, selling 18,554 cars and manufacturing 20,311. It has a comparable production schedule for May and is not expected to let down much until July.

Buick is expected to assemble 7500 cars this month and tentatively has decided on 6000 cars for June. Its retail deliveries during April totaled 6960 units, as against 6534 in March. Even Cadillac, handicapped by the swing in the last few years to cars priced under $1,000, has been perking up. It shipped 3031 Cadillacs and LaSalles from its local plant last month, its best month since September, 1930. May assemblies will be at least as large as those in April. Of course, Cadillac has been busy stocking dealers with the new LaSalle announced late in March. On the other hand, its deliveries to retail customers last month were the largest since April, 1931.

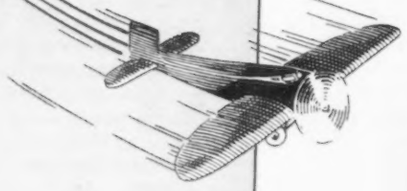
Packard Well Underway

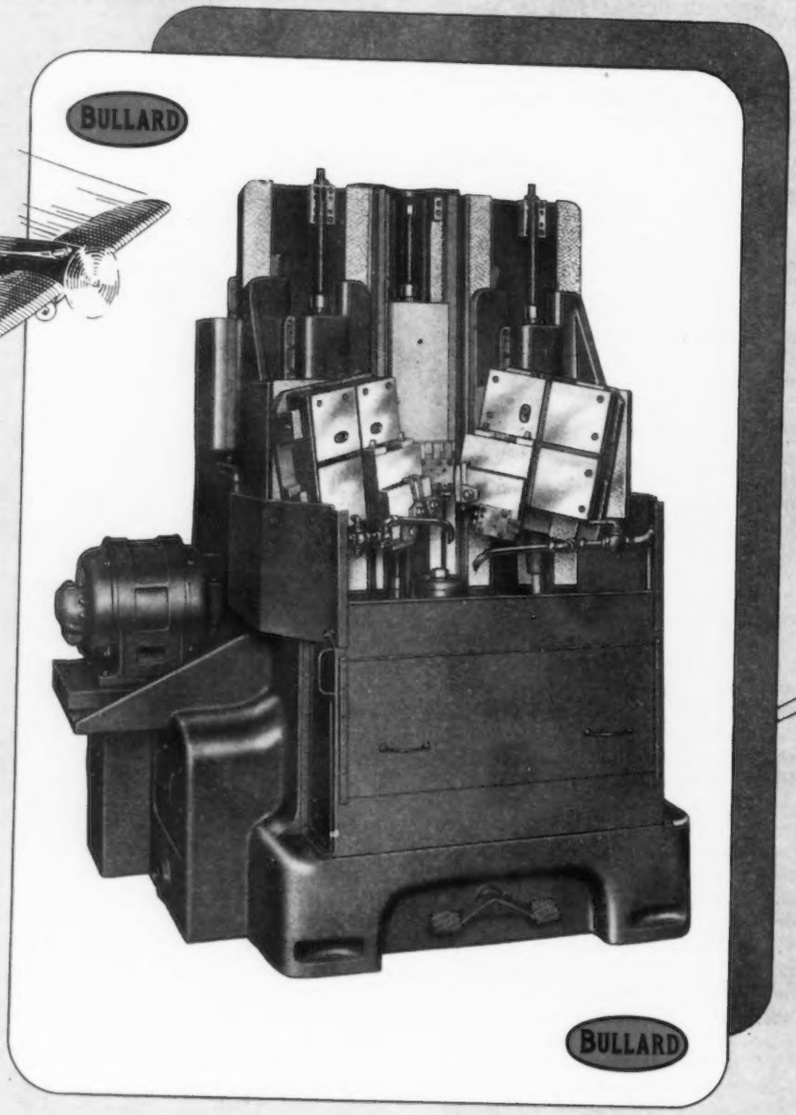
Packard, after being delayed in getting started on its One Twenty series, finally is "going to town" with it. In May it expects 6100 cars to come off its assembly lines, thus establishing the current month as the best in Packard's long history. The biggest previous month was October, 1928, when 5548 cars were turned out. Last Tuesday, Packard built 333 cars, the largest day's production on record. It has orders on hand for 8836 cars. During the second quarter it hopes to make 16,500 of its One Twenties, in addition to a fair schedule of its higher-priced jobs. Packard is said to be considering the possibility of tooling up its machining lines in its One Twenty plant on to the same basis as the cylinder block line, which is geared for 30 an hr. Other lines now are tooled for about half that number.

Nash is about ready to let the public in on its new car to be priced between the present Nash and Lafayette cars. The Milwaukee plant of Seaman Body, Nash subsidiary, is now equipped with a battery of new welding machines,

(CONTINUED ON PAGE 52)

THE ACE





In Aviation, THE ACE stands for Star Performance.

In card games, THE ACE is the Top — and properly applied, affords a means toward net accomplishment.

Likewise, in machine tools, Bullard Vertical Automatic Lathes offer the possibilities for accomplishment — to whit, manufacturing Savings and Profits.

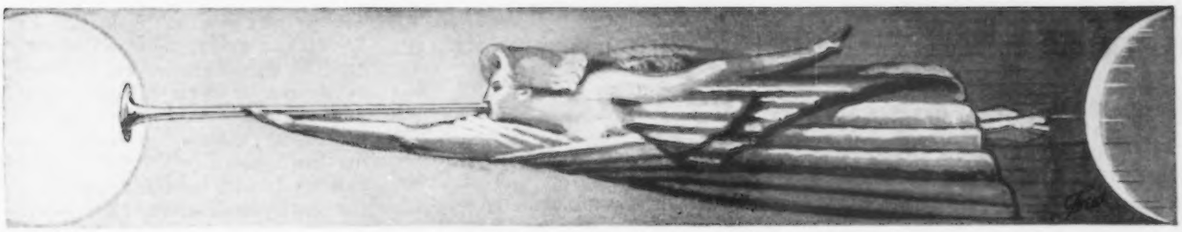
For instance —

Illustration shows work on Forged Steel Crown Gear with operations as follows: Rough face, turn and bore simultaneously with "follow-up" finishing tools for same surfaces.

Time — floor to floor 3 minutes and 7 seconds.

It's time to Play The Ace against Obsolescence. Ask Bullard How it's done.

BRIDGEPORT **THE BULLARD COMPANY** CONNECTICUT



NEWS OF THE WEEK

Steel Industry Had First Quarter Profit—Investment Now 4.7 Billion

THE steel industry operated at a profit during the first quarter of 1935, for the first time since the second quarter of 1934, according to estimates by the American Iron and Steel Institute. Aggregate net earnings for the period are estimated at $8,300,000 after all charges but before dividends.

In the second quarter of 1934, total earnings were estimated at nearly $25,000,000. In the first quarter of 1934, a deficit estimated at $8,600,000 was incurred, and for the entire year the losses of the steel industry were estimated at $25,500,000.

The earnings estimates in each case are based on reports by companies representing more than 86 per cent of the ingot producing capacity of the country.

The average rate of operations based on steel ingot capacity was 49.32 per cent in the first quarter of 1935, compared with 40.27 per cent in the first quarter of 1934. It appears, therefore, that an increase of 9 points in the rate of operations was enough to shift the balance of income from red to black.

Payrolls of the steel industry in the first quarter of 1935 were 21 per cent greater than in the corresponding period of the year before, totaling $135,305,596 as against $111,565,703. Average number of employees in the quarter ending March of this year was 417,552, compared with 405,196 a year ago.

Total investments in the steel industry stood at $4,705,976,350 on Dec. 31, 1934, according to reports made to the institute by 177 companies. This represents a decline of 1.4 per cent from the total of $4,771,017,633 reported by the same companies as of Dec. 31, 1933.

The number of stockholders in the steel industry declined about 4 per cent during the year from 514,244 to a total of 492,376 on Dec. 31. Dividends paid in 1934 totaled $23,130,436 against $20,380,224 in 1933. Wages amounted to $591,009,499 compared with $455,600,916 in 1933, an increase of $135,408,583.

Net property value of the industry was $3,678,246,601 at the close of the year, a reduction of 2.3 per cent from the year before. Total value of cash, United States Government and marketable securities held by the companies increased 10 per cent during the year from $290,207,193 to $319,862,532. Inventories showed an increase of 3½ per cent over the period, being valued at $647,088,627 at the close of last year compared with $625,124,641 one year before.

The surplus account of the entire steel industry, less deferred charges, shrank 4.4 per cent during the year from $1,159,809,096 to $1,108,787,740.

The totals include reports from some consolidated organizations, not all of whose affiliated corporate interests are necessarily steel code members.

Capital Returns Small

If one man owned the entire American steel industry, his five-billion-dollar investment would not have earned him a fair return since 1930. Furthermore, over the past 10 years he would have received 37.5 per cent less income from such an investment than if he had deposited a like sum of money in an ordinary bank savings account.

A compilation of the earnings records of companies comprising a large part of the ingot capacity of the steel industry shows that the weighted average of earnings on capitalization has been only 2.5 per cent, after all charges but before dividends, during the period from 1925 through 1934, a period which includes several of the best years the steel industry has ever experienced. That rate of return compares with the average annual interest rate of 4 per cent paid by banks throughout the country on savings accounts over the same period.

Even in 1929, when more steel was produced than in any other year, the steel industry earned only 9.2 per cent on its capitalization, while in only three of the 10 years covered by the compilation did earnings exceed 5 per cent. In contrast are the aggregate losses of the industry from 1931 through 1934.

Lackawanna Mill Motors Placed

BETHLEHEM STEEL CO. has awarded contracts to the Westinghouse Electric & Mfg. Co. for motors, control and power equipment, costing approximately $1,250,000, to be installed in new hot and cold strip mills of the Lackawanna plant at Buffalo.

Westinghouse has also received contracts for supplying 800 motors and variable frequency units for the roll tables of the mills and motors, motor generator sets and control for a flying shear which catches and cuts to accurate lengths strip steel as it passes through the final rolling process.

Republic Steel Corpn. Announces Group Insurance Plan

REPUBLIC STEEL CORPN. has announced a cooperative group insurance plan under which the employees and the corporation will share the cost of life insurance and sickness and accident benefits. The plan will be offered to all employees of the corporation and its subsidiaries not heretofore included in any group plan.

T. M. Girdler, chairman and president, in an announcement of the plan presented at a meeting of employees' representatives of the Warren district, stated that requests for group insurance had been made by several employees' representatives bodies. Provisions are made for group life insurance and weekly sick and accident benefits based on employees' earnings. The insurance will be underwritten by the Metropolitan Life Insurance Co.

The plan will be made effective for all subscribing employees actively at work after not less than 75 per cent of those eligible have made written application.

SCHEDULE OF BENEFITS

A. Employees earning $900 and less per year:

$1,000 group life insurance
8.00 weekly sickness benefits
8.00 weekly non-occupational accident benefits.
Cost to employee $1.35 monthly—corporation paying the balance of the entire net cost.

B. Employees earning from $900.01 to $1,500.00 per year:

$1,000 group life insurance
12.00 weekly sickness benefits
12.00 weekly non-occupational accident benefits
Cost to the employee $1.70 monthly—corporation paying the balance of the entire net cost.

C. Employees earning from $1,500.01 to $2,500.00 per year:

$1,500 group life insurance
14.00 weekly sickness benefits
14.00 weekly non-occupational accident benefits
Cost to employee $2.25 monthly—corporation paying the balance of the entire net cost.

D. Employees earning over $2,500 per year:

$2,000 group life insurance
15.00 weekly sickness benefits
15.00 weekly non-occupational accident benefits
Cost to employee $2.70 monthly—corporation paying the balance of the entire net cost.

If an employee's status changes so as to place him in a higher class, his insurance benefits and contributions will increase accordingly, provided he is actively at work on the date such increases normally would become effective. Otherwise the increases will become effective on the date he returns to active work.

All present employees who apply for the plan will be insured on the effective date of the plan if they are then actively at work. Employees entering the corporation's employ after the effective date of the plan may make application immediately and will be insured upon completion of three months of continuous service provided they are then actively at work. Subscribing employees absent from work on the date their insurance would otherwise be effective will be insured immediately upon their return to active work.

The insurance is offered without medical examination to every eligible employee. If an insured person leaves the corporation's employ, his life insurance and the contribution therefor will cease at the end of the period for which deduction has been made, and in no event will exceed 31 days. However, arrangements can be made with the insurance company to convert the life insurance, without medical examination, into any of the regular policies issued by the company at the rate application for the insured's age and class of risk within 31 days from the date of termination of the group insurance.

If an employee is totally and continuously disabled from the date he leaves the employ of the corporation and dies prior to his 65th birthday and within 12 months, the amount for which he was insured will be payable to his beneficiary.

Sickness and accident benefits are to be payable beginning on the eighth day of disability and continuing during the period of disability for a maximum of 13 weeks for any period of disability, whether the period be continuous or intermittent. Benefits for disabilities due to different and unrelated causes will be payable as often as they occur, except that for employees over the age of 60 benefits for sickness will be limited to a total of 13 weeks during any 12 consecutive months.

Discussion Announced For Institute Papers

THE program committee of the American Iron and Steel Institute has arranged for formal discussion of the technical papers to be presented at the afternon session of the meeting to be held at the Hotel Commodore, New York, on May 23.

J. C. Whetzel's paper on "Modern Steels and Weight Reduction" will be discussed by W. Robert Shimer, Bethlehem Steel Co., Bethlehem, Pa., and Col. E. J. W. Ragsdale, chief engineer, Edward G. Budd Mfg. Co., Philadelphia. Mr. Whetzel is with the American Sheet & Tin Plate Co., Pittsburgh.

The paper on "Precision Mills for Rolling Strip, Bars and Rods," to be given by S. M. Weckstein, Timken Steel & Tube Co., Canton, Ohio, will be discussed by W. C. Oberg, manager of sales engineering, Carnegie Steel Co., Pittsburgh; Earl Smith, chief metallurgist, Republic Steel Corpn., Youngstown, and J. T. Somers, vice-president, Wyckoff Drawn Steel Co., Pittsburgh

"The Economic Importance of the Replacement of Obsolete Equipment in Steel Mills," to be offered by D. M. Petty, Bethlehem Steel Co., Bethlehem, Pa., will receive discussion from G. Cook Kimball, vice-president, Illinois Steel Co., Chicago, and W. B. Gillies, vice-president, Youngstown Sheet & Tube Co., Youngstown, Ohio.

At the morning session brief talks are scheduled by Eugene G. Grace, president, Bethlehem Steel Co.; Charles M. Schwab, chairman, Bethlehem Steel Co.; T. M. Girdler, chairman and president, Republic Steel Corpn.; William A. Irvin, president, United States Steel Corpn.; E. T. Weir, chairman, National Steel Corpn., and Walter S. Tower, executive secretary, American Iron and Steel Institute.

Motor Strike Costly To Steel Employees

THE strike in the motor industry is costing Armco employees many thousands of dollars in wages, according to Charles R. Hook, president, American Rolling Mill Co., Middletown, Ohio. "Many of the plants which are now shut down because of the strike are customers of Armco," Mr. Hook explained. "They have instructed us to hold shipment of a large tonnage of automobile sheets already on order. In some instances the orders were already made and

ready to ship. It is physically impossible to go ahead and manufacture the remainder of these orders, because we do not have the vast warehouse facilities which would be required. The only thing that can be done is to hold up work until the trouble is settled.

"Naturally, the automobile manufacturers affected are not placing orders for new business. The declining rate of order bookings in the industry is sufficient evidence of that fact. All in all, Armco men are losing thousands of dollars in wages, and the company is losing business because of a strike in plants miles away.

"This is a clear-cut example of an innocent third party suffering as a result of a strike in an entirely different industry, with which the third party and its employees are not personally concerned."

Scrap Exporters to Hold Meeting May 21

AN American scrap exporters' conference will be held at India House, 1 Hanover Square, New York, on Tuesday, May 21, to consider the problems arising out of the large exports of scrap iron and steel. This conference is part of "Foreign Trade Week" which is sponsored by the United States Chamber of Commerce, and which will be celebrated throughout the country to emphasize the important part which foreign trade plays in the economic recovery of the United States.

The scrap exporters' conference, which is the first gathering of this kind in the history of the industry, will be addressed by R. L. Harding, chief of the Iron and Steel Division, Department of Commerce, and by representatives of foreign governments. In addition to scrap iron dealers who are interested in scrap exports, there will also be in attendance representatives of foreign companies which buy scrap. A committee of prominent scrap exporters has been formed to arrange the conference, at the invitation of the Chamber of Commerce.

A feature of the meeting scheduled by members of the National Electrical Manufacturers' Association, the Refrigerating Machinery Association and the Air Conditioning Manufacturers' Association in Hot Springs, Va., the latter part of May will be a joint luncheon on May 23, at the Homestead. Prentiss Coonley, code administrative officer of the NRA, will be the guest speaker before these groups.

Steel Corporation Shipments Show Decline for April

STEEL shipments of the United States Steel Corpn. in April totaled 591,728 tons as compared with 668,056 tons in March. This decline of 76,328 tons was the first recession since last October.

The April movement was sufficient to engage the corporation's finishing capacity at the rate of 36.7 per cent of capacity.

MONTHLY SHIPMENTS OF STEEL PRODUCTS BY UNITED STATES STEEL CORPN.

				1933		1934		1935	
Month	1930	1931	1932	Shipments	Per Cent of Capacity	Shipments	Per Cent of Capacity	Shipments	Per Cent of Capacity
January	1,104,168	800,031	426,271	285,137	17.7	331,777	19.8	534,055	31.9
February	1,141,912	762,522	413,001	275,929	18.5	385,500	26.3	583,137	39.2
March	1,240,171	907,251	388,579	256,793	15.3	588,209	36.6	668,056	41.5
April	1,188,456	878,558	395,091	335,321	21.6	643,009	41.5	591,728	36.7
May	1,203,916	764,178	338,202	455,302	27.1	745,063	44.4	.....	...
June	984,739	653,104	324,746	603,937	37.4	985,337	61.2	.....	...
July	946,745	593,900	272,448	701,322	45.1	369,938	23.0	.....	...
August	947,402	573,372	291,688	668,155	39.8	378,023	23.1	.....	...
September	867,282	486,928	316,019	575,161	35.6	370,306	23.0	.....	...
October	784,648	476,032	310,007	572,897	35.5	343,962	20.6	.....	...
November	676,016	435,697	275,594	430,358	26.7	366,119	22.9	.....	...
December	579,098	351,211	227,576	600,639	38.7	418,630	26.1	.....	...
Plus or minus yearly adjustment.	(40,259)	(6,040)	(5,160)	(44,283)	...	(19,907)	...	.....	...
Total for year	11,624,294	7,676,744	3,974,062	5,805,235	30.1	5,905,966	30.6	.....	...

British Forward Pig Iron Demand Is Strong—More Furnaces to Be Lighted

LONDON, May 13 (*By Cable*)—Pig iron inquiries for third quarter indicate substantial later requirements, but new business is quiet. Output of foundry iron is limited, and production of basic and hematite is readily being absorbed. The early relighting of two additional hematite furnaces in Middlesbrough is likely.

Most branches of steel are active and home demand is expanding. Limitation of imports under the new quota promises further advance. Billet makers are heavily booked. Shipbuilding steel and sheets are dull, but demand for railroad and construction material is keen. Scrap is active. Exports are steady and a large South African contract for steel sleepers has been taken. Interesting Russian business is pending.

Tin plate is quiet and inquiries

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9
Billets, open-hearth	£5 10s. to £5 15s.
Tin plate, per base box	*18s. 2d. to 19s.
Steel bars, open-hearth	£7 17½s.
Beams, open-hearth	£7 7½s.
Channels, open-hearth	£7 12½s.
Angles, open-hearth	£7 7½s.
Black sheets, No. 24 gage	£9 5s.
Galvanized sheets, No. 24 gage	£11 5s.

*To June 1: 18s. 5d. to 19s. 3d. thereafter.

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas	£2 7s.
Wire rods, No. 5 B.W.G.	£4 10s.
Steel bars, merchant	£3 5s.
Sheet bars	£2 8s.
Plate, ¼ in. and up	£4
Plate, 3/16 in. and 5 mm.	£4 2s. 6d.
Sheets, ⅛ in.	£4 7s. 6d.
Beams, Thomas	£3 2s. 6d.
Angles (Basic)	£3 2s. 6d.
Hoops and strip base	£4 2s. 6d.
Wire, plain, No. 8	£5 7s. 6d.
Wire nails	£5 15s.
Wire, barbed, 4 pt. No. 10 B.W.G.	£8 15s.

are poor. Failing improvement, some mills may close.

Continental iron and steel markets are quiet pending outcome of negotiations with English for export agreement. At the Paris meeting, good progress was reported, but it is believed that considerable discrepancy of opinion exists regarding the English share of export markets and early agreement is improbable. Another meeting will be held in London May 20 and 21. Exports of bars are fair and semi-finished steel is livelier. Other departments are quiet but domestic demand is sustained.

Purchasing Agents Program Announced

THE program for the twentieth annual convention of the National Association of Purchasing Agents, to be held at the Waldorf-Astoria, New York, May 20 to 23, has been formally announced.

Among papers of interest to the metal-working industry are the following: "Grading and Preparation of Non-Ferrous Scrap," by E. G. Wertheimer, purchasing agent, Federated Metals Corpn., Detroit; "Buying for Scattered Plants," by B. S. Stephenson, vice-president, American Radiator & Standard Sanitary Corpn., New York; "Buying for Construction in the Field," by A. C. Bull, purchasing agent, Byllesby Engineering & Management Corpn., Chicago; "Controlling Emergency Purchases," by Guy A. Thompson, director of purchases, Empire Companies, Bartlesville, Okla.; "Business Trends," by D. L. H. Haney, professor of economics, New York University, and "Reciprocity," by Howard T. Lewis, professor of marketing, Harvard Graduate School of Business Administration, Cambridge, Mass.

St. Louis Warehouse Group Names Officers

THE St. Louis chapter of the American Steel Warehouse Association, Inc., has elected George K. Conant, Sligo Iron Store Co., president, and Elmer W. Fleer, Schurk Iron Works, and W. Milner Donovan, Donovan Iron & Supply Co., vice-presidents.

Roy De Stabler, Beck & Corbitt Co., and Richard B. Wilson, Joseph T. Ryerson & Son, Inc., were elected as secretary and treasurer respectively.

George K. Conant was designated to serve on the board of directors of the American Steel Warehouse Association, Inc.

PERSONALS

WALTER H. WIEWEL has been appointed manager of sales of tubular products of the Jones & Laughlin Steel Corpn., to fill the vacancy caused by the recent death of Frank D. Grunder. The appointment becomes effective June 1. Mr. Wiewel has for some time been connected with the Timken Steel & Tube Co., and previously was associated with the United Alloy Steel Corpn., the Standard Seamless Tube Co., and Spang, Chalfant & Co.

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FRED A. WALES has become president of Alcote, Inc., Lafayette Building, Detroit, a new company which is marketing the Alcote process, a protective and wear-resistant surface treatment for aluminum and its alloys. E. B. WALES is vice-president and G. F. BRUSH secretary and treasurer of the company. Mr. Wales has been a prominent figure in the aluminum field for 20 years, having developed many new uses for aluminum. He was founder and president of Aluminum Colors, Inc., Indianapolis, which was acquired last October by the Aluminum Co. of America.

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EDWARD L. RYERSON, JR., president of Joseph T. Ryerson & Sons, has been elected to the board of directors of the New York Life Insurance Co.

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SIR JAMES DUNN has been elected president and chairman of the board of directors of the new Algoma Steel Corpn., Saulte Ste. Marie, Ont. Four of the directors of the company, which will replace the old Algoma Steel Corpn., have been named and others will be appointed. Other officers named include: W. C. FRANZ, first vice-president; JOHN A. MCPHAIL, second vice-president and vice-chairman of the board; THOMAS F. RAHILLY, director and general manager; W. JEFFERY, secretary; E. W. SHELL, secretary; E. CAREY, comptroller; and W. H. BIRKS, assistant comptroller.

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ROBERT E. CECIL, who has been identified with the Wm. B. Scaife & Sons Co., Oakmont, Pa., since the liquidation of the Air Tight Steel Tank Co., of which he was formerly president, has been elected vice-president in charge of sales. For a number of years he has been an active member of the American Society of Mechanical Engineers boiler code committee, the welding committee and the joint American Petroleum Institute-American Society of Mechanical Engineers committee for formulating rules for the construction of unfired pressure vessels for the petroleum industry. DALE N. RANDOLPH, who has been with the company for over 25 years, has been made vice-president of the purifying department.

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C. A. BISHOP, since 1929 treasurer of the Anchor Post Fence Co., Baltimore, has been placed in charge of purchases, succeeding the late Guy E. Tarbert. Prior to his transfer to Baltimore, Mr. Bishop was in charge of purchases at the Cleveland plant. He will be assisted by F. M. GUDE, who served in the same capacity with Mr. Tarbert.

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VERNON H. SCHNEE has joined the staff of Battelle Memorial Institute. He was graduated in 1919 from Cornell University and has had a wide commercial experience in the development and application of inhibitors, lubricants, and nonferrous alloys. He will be employed in this field of work at the institute.

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GEORGE M. WILLIAMSON, who has represented the Bruce-Macbeth Engine Co., Cleveland, in Louisiana for many years, will also represent the company in Texas. Headquarters will be maintained at 414 City Bank Building, Shreveport, La., and 2904 Hemphill Street, Fort Worth, Tex.

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DAVID M. AVERILL, for the past 10 years manager of the Nash Motor Co. division at Racine, Wis., has been given the added duties of works manager of the main factory at Kenosha, Wis. The appointment fills the vacancy caused by the recent death of Patrick J. Moohan and combines the direction of all Nash plants. Mr. Averill entered industry in 1898 with the Durant-Dort Carriage Co., working directly under Charles W. Nash. In 1914, when the firm became the Dort Motor Car Co., Mr. Averill was made general manager, resigning in 1924 to join the Nash organization at the time it purchased the former Mitchell Motor Car Co. factory in Racine.

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FREDERICK D. HANSEN, formerly secretary and general manager of the Federal Pressed Steel Co., Mil-

waukee, has been elected executive vice-president and a director of the Perfex Radiator Co., Milwaukee, manufacturing a wide variety of automobile, truck and tractor cooling devices, unit heaters, blast surfaces for air conditioning units, and temperature controls. Mr. Hansen went to the Federal company from the Eddystone Ammunition Co., division of the Baldwin Locomotive Works.

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O. E. MOUNT, secretary and assistant treasurer of the American Steel Foundries, has been elected president of the Illinois Manufacturers' Costs Association.

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JOHN M. MCCOMB, vice-president, Crucible Steel Co. of America, has been elected a director of the Van Dorn Iron Works Co., Cleveland.

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SLASON THOMPSON, founder of the Bureau of Railway News and Statistics, whose handbooks have long been recognized as authoritative reviews of the railroad situation, is retiring from active business.

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C. B. JAHNKE, research engineer for the International Harvester Co., was a recent speaker before the Chicago chapter of the American Society for Metals. He described and illustrated a modern development of Diesel engines for trucks and heavy tractor operations. Design differs from the conventional diesel in that this engine is started with a carburetor as an ordinary gasoline motor and is later converted to a higher compression oil-burning Diesel engine after the temperature of the motor becomes high enough to support combustion of the fuel upon injection.

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W. B. SULLIVAN, pioneer in the development and manufacture of heat and corrosion-resistant alloy castings, and organizer of the Michiana Products Corpn., has joined the alloy department of Lebanon Steel Foundry, Lebanon, Pa.

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JOHN J. CROWE, engineer in charge of apparatus research and development, Air Reduction Sales Co., Jersey City, N. J., whose election to the presidency of the American Welding Society was announced in these columns recently, has been prominently identified with the A.W.S. and other associations for several years. Born in Washington in 1886, he attended the public schools of that City. From the George Washington University, he went to the Bureau of Standards, starting as an apprentice in heat and pyrometry and advancing to associate physicist and metallurgist. In 1915 he joined the laboratory staff of the Boston Navy Yard as physical metallurgist in the development of anchor chain and other work, and two years later took charge of the metallurgical and physical testing laboratory of the Philadelphia Navy Yard. His association with the Air Reduction company began in 1924. He holds a number of patents on oxy-acetylene equipment.

Mr. Crowe is a past director of metallurgy at Temple University, and has been a director and senior vice-president of the society that he now heads. He has also served as director of the American Society for Metals, as well as chairman of both the Philadelphia and New York chapters of that society. He is a member of the American Institute of Mining and Metallurgical Engineers, the Compressed Gas Manufacturers Association, and the International Acetylene Association.

In addition to his association offices and committee memberships, Mr. Crowe has been a contributor of several association papers and technical articles. These include: "Economies Through the Use of High Purity Oxygen"; "Effect of Tip Sizes and Pressures on Economy of Cutting"; "Location of AC_2 Point in Pure Iron"; and "Finishing Temperatures of Rails."

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C. M. EASON, secretary-treasurer of the Fawick Mfg. Co., Waukesha, Wis., manufacturer of industrial clutches, has been elected chairman of the Milwaukee Section, Society of Automotive Engineers. He succeeds C. E. FRUDDEN, chief engineer, tractor division, Allis-Chalmers Mfg. Co. ARTHUR W. POPE, JR., research engineer, Waukesha Motor Co., Waukesha, Wis., was elected vice-chairman; GEORGE W. CURTIS, Milwaukee district manager, Timken Roller Bearing Co., secretary, and R. W. WILSON, secretary and general manager, Perfex Radiator Co., Milwaukee, treasurer.

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ALFRED J. KIECKHEFER, of Milwaukee, president of the National Enameling & Stamping Co., has been added to the directorate of the Allis-Chalmers Mfg. Co., Milwaukee. He also is a director of the Granite City Steel Co., Granite City, Ill., and member of the executive committee of the American Hardware Manufacturers Association, and is a director and vice-president of the Fabricated Metal Products Federation.

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JEROME RAPHAEL, a student at Massachusetts Institute of Technology, won first prize in the seventh annual bridge design competition held by the American Institute of Steel Construction. ALEXANDER MATTHEWS, JR., a student at the Yale School of Engineering, won second prize. First honorable mention was given to DAVID HIAT, of New York University, and second honorable mention to FRED A. THOMPSON, JR., of Iowa State College. The problem was to design a steel grade crossing elimination bridge carrying a highway over a railroad and another highway parallel to the railroad. In addition to giving the students certificates of award, the first prize carries a cash compensation of $100 and the second prize $50.

OBITUARY

EDWARD MARTIN ADAMS, first vice-president in charge of sales and a director of Inland Steel Co., Chicago, died at St. Joseph's Hospital, Hot Springs, Ark., May 8, at the age of 58. Mr. Adams had gone to Hot Springs for a vacation late in March. He was stricken while there on April 24 with a

EDWARD MARTIN ADAMS

heart attack to which he succumbed two weeks later. He was born at Cherry Valley, Ill., on Dec. 1, 1876. As a young man he was in the employ of the Illinois Central Railroad and served a term as Mayor of the city of Harvey, Ill. He was subsequently employed by the Buda Co., Harvey, Ill., as purchasing agent and in other capacities. On June 17, 1907, he entered the em-

(CONTINUED ON PAGE 71)

High Test Cast Iron Discussed At Foundrymen's Meeting

VARIOUS aspects of high test cast iron were discussed at a sectional meeting of the American Foundrymen's Association in East Lansing, Mich., May 9, 10 and 11. The Detroit Foundrymen's Association and Michigan State College cooperated with the national association in staging the three-day sessions. The banquet on May 10 was a high spot of the meeting, with Governor Frank D. Fitzgerald and Dan M. Avey, president of the American Foundrymen's Association, as guests of honor.

Speaking on "The Practical Aspects of Founding High Test Cast Iron," W. R. Jennings, Ecorse Foundry Co., Ecorse, Mich., stated that the secret of high test irons is contained in the phrase "consistency in practice." He emphasized that "consistency of pig iron, scrap, steel, coke, melting conditions, volume and pressure of air—these can only be maintained uniformly by constant check and double check." He urged constant use of a good laboratory, making sure that it doesn't "become a morgue."

The opinion was expressed that the cupola as a melting unit in making high test cast iron is not being used to within 50 per cent of its potential capacity. Care should be exercised to insure uniformity in the charging and in the materials used. "We would not consider shoveling rusty, dirty scrap and steel into an electric furnace," commented Mr. Jennings, "in order to obtain the best results. Why should we impose on the cupola?"

Most high strength irons of cupola production have a total carbon range of 2.90 to 3.35 and silicon of 1.80 to 2.10 per cent. A good grade of coke must be used and materials must be carefully selected. Scrap-free pig iron should be specified, if additional scrap is to be employed. In most sections of the country scrap can be bought cheaper in the form of scrap than in the form of pig iron. Scrap should be as free as possible from scale and dirt. A thin, rusty piece of steel scrap can readily be 15 to 20 per cent oxide. A piece of scrap steel 1 in. thick will melt at about the same rate as a standard pig. This explains why, in hand charging, light scrap should be placed in the center of the charge, where the temperature is lowest. Alloy briquettes likewise should be put in the center of the charge.

The depth of the hearth, or the distance from the tuyere to the sand bottom or from the slag hole to the sand bottom, is important. It should be kept as shallow as possible, preferably 8 to 12 in. in the average cupola. Use of a forehearth or a receiving ladle so that the iron does not remain in contact with the coke in the hearth of the cupola for any length of time is desirable to secure the best control of carbons. In the average cupola operation, a shutdown of 15 min. will add 15 to 30 points to the total carbon. If the metal is drained from the cupola during the shutdown, using a forehearth or receiving ladle, there will be little change in the carbon and a reduction will occur in the sulphur pickup. Better machinability is obtained if the sulphur content is kept below 0.12 per cent.

If the casting is not poured at the proper temperature with the proper gates and proper volume, the best-made mold will not always produce a salable casting, asserted Mr. Jennings. Heavy sections are best made in skin dry or dry sand molds and sections 3/16 in. to ½ in. thick in sands with a low amount of fines. Since high temperatures have a severe eroding action at the gate area, synthetic sands can be utilized, although they air dry much sooner than natural molding sands. If a mold must be left for any length of time, sprues, gates and risers will have corroded edges, a condition which can be helped by a gluten or kerosene spray at these areas.

If the core is of the type which can readily be vented, it should be coated with the best core wash obtainable when castings are poured extremely hot, advised Mr. Jennings. On the other hand, if the core is intricate and has to vent itself through the cope, it cannot be coated and an open core with the best grade of core oils is suggested. Castings should be poured hot, but slow. Shrinkage seemingly is in proportion to the carbon content where uniform melting operations are maintained, although there are many other contributing factors, such as design. Mr. Jennings expressed the belief that a large quantity of defective castings blamed on the molder or on sand are due to defective gating and risering.

High strength iron requires plenty of coke, a ratio of 5-7 to 1 not being out of line. Generally gas holes are caused by improperly vented cores or molds. Most of the difficulty with gas condition is attributable to improperly operated cupolas. It is a safe plan to keep the coke bed high.

Gating Governed by Design and Experience

In gating a casting, one should be governed by design and experience with the metal being handled, stated Mr. Jennings. A low carbon solid bushing, 6 in. in diameter and 12 in. long, has been poured through a single gate ¼ in. in diameter. No riser was used, yet only a slight pulldown occurred on the top. In the same casting made with a conventional gate, a heavy riser was necessary to get a similar soundness and consistent Brinell numbers. From a practical standpoint, it was desirable to use the riser because the iron could be dumped in the mold. With a gate the size of a pencil, the iron pouring was slowed up so much that the saving in extra metal and riser was overcome by the extra labor required.

"With cupola metal we generally gate on the thin section and riser or chill the heavy section, depending on the rate of pouring, to cause uniform setting of the metal. Due to the shortness of the setting range of low carbon irons, we have on many castings reversed this process and, by gating in the heavy section, avoided supercooling in the light section. We also can have this gate a combination feeder and gate, with a strainer gate-to riser-to casting combination. The iron enters the casting by this method gently, causing no mold wash and leaving a clean dense casting.

"In these irons of a higher freezing point, get the iron into the mold with the least possible delay and least disturbance of the metal. Have the gates enter as low on the castings as design will permit, and in all cases use a relief sprue so that the iron can be forced into the casting without danger of strains or swells. Don't have the cope too shallow. Low carbon irons, if melted right and poured hot, feed well. Too often you will notice the gate sprue drawn down to a lower level than the height of the casting itself. Keep the sprue and riser full. When in doubt, have a follow-up man touch the risers up with hot metal."

Castings which show a wide Brinell range from thin to heavy sections are indicative of casting strains and will distort when one surface is removed by machining much more readily than a casting

(CONTINUED ON PAGE 70)

THIS WEEK IN WASHINGTON

Washington seethes with activity as scramble for works relief money sets in.

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Specter of taxation increases inflation fears but Supreme Court's pension decision promises to revive gold clause case.

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Undiscouraged by outcome of railroad case, Administration will appeal lower court's decision in Weirton case.

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Government control of codes to be tightened in broad revisions proposed by NRA.

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Family row breaks out among New Dealers as Secretary of Commerce assails Foreign Trade Adviser.

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BY L. W. MOFFETT
Resident Washington Editor, The Iron Age

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WASHINGTON, May 14.—Applications pour in from all sections of the country as the $4,000,000,000 works-relief program is opened. . . . Washington again becomes a seething seat of scrambling and fury as preparations are made for the greatest outpouring of money ever undertaken . . . with politicians eagerly reaching for their pie.

The country becomes increasingly dazed and punch drunk, wondering what will be staged next by the nation's capital . . . with many non-politicians predicting that this nose dive to spend the way to prosperity will fall far short of its widely advertised purpose to reemploy 3,500,000 directly and an equal number indirectly. . . . Stimulation to industry will be felt, they admit, just as it was felt under PWA . . . but, again like the PWA program, it will be relatively small and slow as measured against the amount to be expended and the vastly greater and more permanent recovery that would ensue under private initiative. . . . The latter is restrained, fearful of the orgy of legislative "reforms," which it is urged should await recovery, and then toned down and made sounder.

A Race for Works Relief Money

The works project "boom" recalls the hectic early weeks of NRA in that it has added to confusion worse confounded, with the mad rush hither and thither at the different buildings housing divisions charged with handling the huge works-relief program. . . . Governors are going so far as to send personal representatives to Washington to see that their States get their "quotas." . . . Mayors likewise active . . . not that States and municipalities are not entitled to go up to the pie counter . . . yet it would be more seemly if they used forks rather than shovels.

ACA Is Born

The New Dealers are finding their hands full in separating worthy projects from unworthy ones. . . . They started their work when the Advisory Committee on Allotments . . . which by reason of the infectious alphabetical mania supposedly soon will be called the ACA . . . met at the White House and segregated the relief appropriation . . . cutting squarely in half for 1935 the sums carried in the act itself . . . making a total of $2,000,000,000. . . . Hence, by doubling the following amounts now set aside, the ultimate total for each project becomes known. . . . $400,000,000 for highways, roads, streets, and grade-crossing elimination . . . rural rehabilitation, etc., $250,000,000 . . . rural electrification, $50,000,000 . . . housing, $225,000,000 . . . Civilian Conservation Corps, $300,000,000 . . . loans and grants to States, municipalities, etc., $450,000,000. . . sanitation, prevention of soil erosion, reforestation, flood control, etc., $175,000,000.

Made up of Federal officials for the most part, as it should be, the board also is represented by business through Gen. Robert Wood (Sears, Roebuck & Co.) of the Business Advisory Council, farm organizations through Ed O'Neil, and mayors through Mayor LaGuardia of New York. . . . Its first meeting, at the White House last Tuesday, will be regularly followed by meetings there each Monday to

take action on specific projects.... The final source of approval will be the President, taking on this enormous additional responsibility in addition to his multiplicity of other burdens, well knowing disposition of the funds will be carefully watched . . . and with an oncoming Presidential campaign near at hand.

Steel Mills Not Likely to Benefit Immediately

Steel makers and fabricators see large tonnages in the projects but are doubtful that they will reach mills and shops for several months. . . . The American Association of State Highways lists by States 10,732 construction and reconstruction highway projects totaling $789,666,890 and 1739 projects of construction and reconstruction of trunk line routes through cities and city by-passes costing $203,732,800 for which it states Federal and State departments are already organized to supervise without loss of time. . . . More than 80 per cent of the sums to go for wages . . . with no competition with private enterprise.

The Specter of Taxation

Some of the money is to be loaned, and some of the projects are to be self-liquidating, so that part of the funds will be salvaged. . . . but the outlay only emphasizes the inevitable approach of taxation, and it will not be confined to inheritance taxes, ballyhoo to the contrary notwithstanding. . . . It can't be a 100 per cent "soak the rich" effort, as much as political demagogues desire that that be the sole principle.

The Administration appears to be fighting inflation from bonus legislation, as denoted by the President's stand on the Patman bill.... Yet bonus threatens, regardless of previous assurance to the contrary. . . . The "advice" of business against it got nowhere, and that was prophesied long ago.

White House to Give Business an Ear

But the White House says it will heed business as Secretary of Commerce Roper's Business Advisory and Planning Council, made up of 50 business men, kicks because its reports and recommendations going to the White House have been treated as just so many more reports and recommendations. . . . The council, acting as buffer in the row between the Chamber of Commerce of the United States and the White House, didn't like the impression that it had turned on its business and chamber colleagues.... It was felt that while it had assured the President of support of NRA and social security legislation, with "proper" revisions, the impression was given that it had turned thumbs down on the Chamber, which, of course, it did not do. . . . Most of all it did not like the idea of having its reports and recommendations pigeonholed when they did not suit the Administration and only reports and recommendations favorable to the Administration made known. . . . The upshot is an agreement reached with the President to publish reports and recommendations after the Administration has discussed both recommendations and criticisms made by the council. . . . And it is hoped the agreement sticks. . . . Move is looked upon as an effort to heal the widely heralded breach between the Administration and business . . . another of many "breaches" coming forth these days like steam engines in breeches. . . . The House became curious about the latest breach and Representative Martin, Democrat, Colorado, put through resolution asking the President if he would mind sending Speaker Byrns a transcript of the White House press conference in the course of which the President answered the Chamber criticism . . . the President "minded" by telling the Speaker politely that the former did not believe it advisable to set such a precedent. . . . "I much prefer to continue the (press) conferences in the free, informal fashion," said the President . . . to which the press agrees.

Roper Locks Horns with Peek

Meanwhile, members of the New Deal family row among themselves again over foreign trade policies. . . . George N. Peek, foreign trade adviser to the President, this time draws the fire of Secretary Roper, who charges Peek with handling loosely figures taken from the Department of Commerce's report on the balance of international payments in an effort to "support a particular conclusion," the Peek conclusion being that foreign countries had more than enough dollar exchanges to purchase American commodities but that they were using the money instead to buy American securities.... Secretary Roper, entering the family quarrel for the first time, supported Secretary of State Hull's theory of "multi-lateral" trading in opposition to the "bilateral" view of Mr. Peek, who would swap "hosses" nation by nation in contrast to granting of the most-favored-nation treatment to all nations under reciprocal trade agreements. . . . Senator Vandenburg, of Michigan, rated as possible Republican candidate for President, assails State Department policy. . . . Nevertheless, President is represented as siding with Mr. Hull . . . and there is speculation as to how long Mr. Peek may be kept as a member of the New Deal family.

Pension Decision Starts Word War

Forces opposing the Administration insist the Supreme Court decision against the railroad pension law strikes a dangerous if not fatal blow at the security program, Wagner labor bill, NRA, etc.... Administration supporters stoutly insist it does nothing of the kind and are proceeding with their program as though they meant business. . . . Lawyers disagree and the merry wordy war proceeds apace. . . . James A. Emery, general counsel, National Association of Manufacturers, says the decision has a significance "far beyond its present application for it operates against the taxing power no less than against the commerce power or any other authority against the misuse of which it is the people's protection." . . . Pointing out that the pending social reform bill providing unemployment reserves and old-age pensions would use the taxing power, Mr. Emery says that "despite the existence of dissent the court was not divided but was unanimous on the major proposition that the act as written was 'beyond the power of Congress.'" . . . He thinks the opinion will probably be accompanied by "the usual sneers at 5 to 4 decisions" and adds: "A majority of one in a court is a subject for criticism. A majority of one enacting a law of Congress would be warmly welcomed by the victor."

One Court Test After Another

It's just one test after another . . . one in the offing is the Weirton Steel Co. case which the Department of Justice is to appeal to the Supreme Court after having been defeated in the Federal court at Wilmington, Del., holding the collective bargaining section of the Recovery act unconstitutional. . . Then preparations are being made by prominent financial interests to bring the gold case before the Supreme Court again.... The case, so it is said, will be based on the former ruling of the court that Congress had no power to nullify the gold-payment clause in the Government's own securities. . . . The plan, as reported, is to ask the Treasury on June 15 to accept a $1,000 Treasury note maturing on that date in payment of $1,690 in income taxes, inasmuch as the Treasury had promised to accept the note at par, making the security receivable for taxes equal to 1000 times 24 4/5 grains of gold

. . . and the gold equivalent of the dollar is now 15 5/21 grains.

It's just one trial and one tribulation after another. . . . But's what's money and who knows anything about it. . . . Some of the so-called best minds in Congress run in widely separated channels on the subject. . . . Observe differences over the Eccles bill, Administration sponsored, passed by House and headed for ripsnorting attack in the Senate by old line Democrats . . . but headed for passage nevertheless with further extension of Government ownership . . . ownership of the Federal Reserve banks and ownership of credit.

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Brazil Manganese Market Improves

Brazil's trade in manganese ore is showing signs of revival, according to a report received from Consul O. G. Loren, Rio de Janeiro. At the present time, it is stated, there appears to be renewed interest in the purchase of the Brazilian product by the United States, Germany and Japan. Japanese interests, the report says, have been negotiating with various firms to purchase 1,500,000 tons for future delivery. In view of the past productive capacity of local manganese mines, according to Consul Loren, it would take several years to fill this order.

The principal sources of manganese ore in Brazil in the past, it is pointed out, have been in a district about 300 miles northwest of Rio de Janeiro. These deposits are declared to be the most economical to mine and are best situated with respect to transportation to world markets. In this area it is estimated by mining men that there are over 16,000,000 metric tons of workable ore reserves.

While the report said nothing about it, it is to be expected that Brazilian manganese ore imports into the United States will reflect a rise when the American-Brazilian tariff agreement is ratified by Brazil. The agreement provides for a reduction of 50 per cent to one-half a cent per pound on contained manganese.

Brazilian manganese exports in 1934 totaled only 2300 metric tons, compared with 361,829 tons in 1928. The decrease was coincident with the world depression in the steel market and also reflected the entry of Russian manganese ore into the market.

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Government To Appeal Weirton Case

The Department of Justice is preparing an appeal from the decision of Judge John P. Nields of the Federal District Court at Wilmington, Del., which held that the company union is a proper agency for collective bargaining and that Section 7-a of the National Industrial Recovery Act is unconstitutional. The appeal is being prepared by Judge Nedeker, special assistant to the Attorney General, who had charge of prosecuting the case. The Government has until June 7 to file the appeal with the court at Wilmington.

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Labor Board Dismisses Kansas City Union Case

Holding that it had found no evidence that the Butler Mfg. Co., Kansas City, Mo., had discharged 19 members of the International Brotherhood of Boiler Makers, Iron Ship Builders and Helpers of America because of union activity, the National Labor Relations Board has dismissed a complaint brought by the brotherhood. The complaint was made to the Kansas City Regional Board that the employees had been discharged by the company 10 days after a request for a conference with the company's general manager. Violation of Section 7-a was alleged.

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Steel Board Dismisses Mel Moore Case

Mel Moore, star absentee roller for the Weirton Steel Co., lost his case before the National Steel Labor Relations Board, which last Wednesday held he had no basis for his complaint that he was discharged because of his union activities. Moore, outlawed by the Amalgamated Association of Iron, Steel and Tin Workers, was absent from his work 36 times during a period of one year before he was discharged, the board pointed out. During the same time there were only nine absences from work among all other rollers employed in the Weirton, W. Va., plant of the company where Moore worked. Moore was absent in order that he could engage in activities on behalf of organized labor "and for other reasons," the board said.

"The complainant was cautioned about these absences," said the board, "and counseled against any further recurrence thereof. It was admitted by Mr. Moore that his production was the lowest of the four rollers who worked in shifting turns on the same mill on which he was employed."

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British Iron and Steel Exports Improve

British export trade in iron and steel during the first quarter of the current year showed appreciable improvement compared with the corresponding periods of the two preceding years, according to a report from James Somerville, Jr., assistant commercial attache at London.

Shipments abroad during January-March, 1935, totaled 529,926 tons, an increase of 11 per cent over the March quarter of 1934 and 20 per cent over the corresponding figure for 1933. Of the total exported in the quarter under review, 295,138 tons were destined to British countries, an increase of 18 per cent over the 1934 figure and of 46 per cent compared with 1933. The chief importing countries were British India, and the Union of South Africa, both of which showed large increases, the report states.

British iron and steel exports to those countries with which the first of the 1933 trade agreements were concluded, namely, Finland, Norway, Sweden and Denmark, totaled 45,492 tons, an increase of 31 per cent over 1934, and an increase of more than 100 per cent over 1933. Denmark and Sweden registered the largest increases.

Exports to the Soviet Union totaled 9762 tons, 1.6 per cent below the 1933 total, but a decline of 67 per cent compared with the high total for the March quarter of last year. Exports to Argentina amounted to 28,231 tons, an increase of 24 per cent over the corresponding 1934 total, but an increase of only 8.5 per cent over the 1933 figure. Exports to China decreased in 1934 but have improved in 1935 and the same trend was noted in the case of Brazil, Mexico and Japan.

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Would Reduce Cast Iron Pipe Rates

Rates on cast iron pipe from the Birmingham, Ala., district and from Chattanooga, Tenn., to destinations in the western part of Western Trunk Line territory will be sharply reduced if the Interstate Commerce Commission approves a report proposed by Examiners H. W. Archer and Leo J. Flynn. The report says that a proposal made by the Board of Railroad Commissioners of South Dakota, one of the interveners, represents a reasonable and logical basis of rates.

Building the new schedule, the examiners set up a basic scale for the entire short line distance like that prescribed in the general iron and steel scale, and to the different zones add arbitraries, beginning with 10 per cent over the basic scale. The effect of applying this scale, based on the South Dakota commission proposal, would be to slash rates to the Dakotas from

$1.51 to $5.83 per net ton. This minimum and this maximum reduction is shown by comparing present rates from Birmingham with those proposed.

The existing rate of $14.11 to Aberdeen, S. D., would be cut to $12.60, while the present rate of $20.93 to Marmarth, N. D., would be reduced to $15.10. Some northern producers of wrought steel pipe have filed protests against reduced rates on cast iron pipe to the western territory affected. Broadly, this territory covers the greater part of Minnesota, all of North Dakota, all of South Dakota except Sioux Falls, and sections of Nebraska, Iowa, Kansas, Missouri, Colorado and Wyoming.

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Connery Labor Bill Reported Favorably

Almost a twin to the Wagner labor disputes bill, the Connery labor relations bill was favorably reported by the House Committee on Labor. The only difference between this measure and the Wagner bill is that the House Committee, being more gallant than the Senate Committee on Education and Labor, places the proposed National Labor Relations Board under the jurisdiction of Madam Secretary of Labor Frances Perkins. The Senate Committee rudely brushed aside Miss Perkins' proposal that the board be made an offshoot of the Department of Labor and insisted on this "Supreme Court of Labor" being entirely independent of any Government department.

Representative Connery, chairman of the House Committee on Labor, said he would ask the rules committee to grant a rule permitting early action on the bill. He also wants early action on his 30-hr. week bill. Senator Wagner also wants early action on his bill. And Senator Black, Alabama, wants early action on his 30-hr. work week bill. And the country wants Congress to take early action in folding up and going home. Which Congress will not do. Because it can't if it even approaches action on the mess of "reform" bills on and off the Administration "must" program.

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Highway Steel Requirements Large

The $400,000,000 already set aside out of the $4,000,000,000 works relief fund for highway construction will involve approximately 428,000 tons of concrete reinforcement bars and structural steel, according to estimates obtained from the offices of the American Road Builders' Association. Indirect requirements for steel in the way of road machinery, plant construction and equipment for the production of the necessary machinery will run even larger, and are estimated at more than 200,000 tons for every $100,000,000 of expenditure, although this proportion obviously would not continue once plant and equipment installations have been completed.

The association was unable to make an estimate of total indirect requirements but it is believed they will run to about 800,000 tons. The $400,000,000 on this basis would require in excess of 1,228,000 tons of steel. The total amount carried in the highway construction fund is $800,000,000, half of which has been segregated for allotment in 1935. The total steel requirements, it is estimated, will run close to 2,000,000 tons.

Funds for highway construction are the first that will be allotted from the works relief program on Thursday of this week when the Works Allotment Board meets.

The Supreme Court of the District of Columbia has granted an injunction enjoining the National Labor Relations Board from certifying a complaint against the Berger Mfg. Co., Canton, Ohio, subsidiary of the Republic Steel Corpn., to the National Compliance Council.

The National Labor Relations Board on May 4, in response to a petition by the Loyalty Local No. 18903 for an election at the Berger plant, informed the company that unless it acceded to the holding of an election within seven days the board would certify the case to the National Compliance Council on the grounds that the Berger company had refused to bargain collectively.

The injunction was granted on a petition by the Berger company and enjoined the board from certifying any complaint to the National Compliance Council and further enjoined the council from removing the company's Blue Eagle.

Construction Code Amended — Other News

WASHINGTON, May 14. — The NIRB has approved an amendment to the code of fair competition for the construction industry giving the national code authority power to consider and examine any amendments proposed to the supplemental codes. The purpose of the amendment is to bring about proper coordination within the industry and between its various divisions and subdivisions.

Marine Equipment: The NIRB has approved an application by the code authority for the marine equipment manufacturing industry to stay until June 16, 1935, Article XI, Section 17, Subsection (a) of the code, insofar as it applies to industry members engaged in the manufacture of cushions, fenders and life preservers.

Article XI, Section 17, Subsection (a) reads as follows:

"Section 17—To give more favorable discounts and/or terms than the following, except boat oars and paddles: (a) No more favorable terms than 2 per cent discount shall be granted a customer on invoices dated from the first to the fifteenth of any month, if payment is mailed or otherwise made by the twenty-fifth of the same month; or on invoices dated from the sixteenth to the end of the month, if payment is mailed or otherwise made by the tenth of the next succeeding month."

Wire Rope and Strand: The NIRB has approved amendments to the code of fair competition for the wire rope and strand manufacturing division of the fabricated metal products manufacturing and metal finishing and metal coating industry. The amendments prohibit the practice of guarantees against price declines; exempt export trade or sales or shipments for export trade from code provisions relating to prices, sales and marketing; authorize the supplementary code authority to present amendments on behalf of the industry as a whole; provide for a voluntary plan of liquidated damages to secure code compliance; and increase the membership of the supplementary code from 16 to 17 members.

Railroad Car Building: The NIRB has approved two amendments to the code of fair competition for the railroad car building industry, designed to save industry members from losses frequently incurred in the past by using defective materials furnished by customers which resulted in rejection of their finished products. The amendment to Section 1 of Article VII, is designed to obviate the confusion which has resulted from the present provision, since one employer, in making a bid, was not able to determine whether others were invited to bid on a project. A new section was added to Article IX, prohibiting the making of allowances in quotations for materials to be furnished by a customer, except those in his bona fide inventory, or where the source of supply is specified by the customer, except in the case of specialties.

Broad Revisions in Major Codes Under Consideration by NRA

WASHINGTON, May 14.—Broad revisions in major codes loom. Restrictions on output and on new installations, all forms of price fixing, except in raw resources industries, maintenance of resale prices, and other features of codes may be wiped out entirely, or considerably modified. Even governing bodies may be changed so that they will come under the jurisdiction of the Government almost entirely or at least to a much greated degree than now prevails under code authorities of industries themselves.

Running entirely counter to the dominating industrial view generally, these changes are seen as a prospect as NRA, which has been described as being in a "state of progressive paralysis," takes on renewed but quiet activity in studying code revision while Congress prepares to overhaul the Recovery act.

Moves to these ends were indicated by Chairman Donald R. Richberg at a press conference last Thursday. They are, of course, dependent upon Congressional action.

Codes to Be Limited to Interstate Business

Outstanding plans specifically mentioned by Mr. Richberg were:

Elimination of industries engaged wholly in intrastate commerce or not "substantially affecting interstate commerce."

Resort to Federal Trade Commission "cease and desist" orders to enforce all but major code violations to replace court action. It is likely this will mean an expansion of FTC in order that its work might be expedited.

Setting up a master code, subject to necessary amendments, to govern a consolidation of minor industries.

Blue Eagle to be retained but only as a symbol of compliance rather than being used as now as a punitive instrument by being removed for minor as well as major violations. It would be removed only for serious violations.

One end sought is simplification of codes, many of which have become so highly complicated that interpretation has become extremely difficult, if not impossible.

Major Codes May Be Reopened

The huge task of code revision now under way, in all probability, will mean reopening of major codes and public hearings in Washington, a return to the early days when NRA was engaged in code-making. The rush and turmoil, however, which existed originally, is expected to be greatly lessened, inasmuch as the system of code-making and administration has become fairly well established. Mr. Richberg refers to the present program as the "third phase" of NRA. Code-making and enforcement were called the first and second phases respectively.

"The NRA is rapidly taking shape on the assumption that there will be an extension of the law," Mr. Richberg said. "If Congress passes the bill as late as June 1, code revision will be a tremendous job. We can only assume extension of the law and go ahead on that basis now."

The revision will be adjusted to action taken by Congress. It was also indicated that should the Supreme Court hold important sections of the Recovery act unconstitutional, changes would also be made accordingly. It was made clear that NRA in any event hopes to continue its existence.

Industries generally are urging that the Recovery act be continued, most of them favoring the Administration two-year extension bill and opposing the pending Clark resolution for a nine-month extension and the barring of price fixing and regulation of intrastate commerce.

Legislation Likely to Be Delayed

While NRA would like to see quick legislative action, it seems clear it will be several weeks before it will be taken. The Senate has on the calendar ready for early action the Clark resolution, which NRA does not like. It has therefore made presentations before the House Committee on Ways and Means through Mr. Richberg in favor of the Administration bill. Democratic Senators in a conference last Friday decided not to change the Clark resolution. Chairman Doughton of the Ways and Means Committee has taken an entirely sympathetic attitude toward the Administration bill.

Consequently even after both branches of Congress have acted on the legislation it would have to go to conference in order to wipe out the conflict, assuming the Senate passes the Clark resolution and the House passes the Administration bill. Many doubt that this could be done by June 1. They are more inclined to think it could not be done much before expiration of the present act on June 16. The Clark resolution would extend the present act as in its present form for 30 days, and the Administration bill would extend it 90 days in order to give time for necessary readjustments.

Simplification to Be Sought

The first task taken up by NIRB in its work of code revision, according to Mr. Richberg, relates to definition of industry to be covered in codes. In this question will be involved elimination of overlapping codes and of conflict in codes, together with the determination of business coming under Federal jurisdiction.

This effort is being made on the assumption NRA will be strictly limited to industries coming within the definition of interstate commerce. The existing law, it was pointed out, allows codification of any business, but enforcement can be applied only to interstate business. Realizing the difficulty involved, Mr. Richberg said determination as to whether an industry is engaged in interstate commerce will have to be based on each case. The question never will be settled, he stated.

Government Control of Codes to Be Tightened

Implication of broader Government control over code operation was seen in discussion by Mr. Richberg of code enforcement.

"We must draw a line between self-governing activities and compulsory activities, which can be carried on only by public officials," said Mr. Richberg. "There is every reason to encourage trade associations to carry on private activities, but all public control must be in the hands of public officials. Prosecutions for violation must be conducted exclusively by the Federal Government."

Going further, Mr. Richberg criticized the term "code authority," which he said is a misnomer. Groups should be called "code committees," he stated.

"The present term," Mr. Richberg declared, "assumes compulsion, which should be a Government function."

There is a growing sentiment in Congress and apparently within NRA itself that so-called code authorities ought to be made up of Government officials either entirely or to a point of dominance. Then, too, organized labor is increasingly insistent on representation on all code authorities.

NRA Not Opposed to Lifting Ban on New Capacity

These are some of the reflections pointing to wide changes in code

structures that promise to materialize. The sentiment against price fixing, resale price maintenance, limitation on output, likewise has gained strength. It is confidently expected such provisions will be either eliminated entirely or considerably modified, except as to price fixing in natural resource industries.

In connection with the question of limitation provisions, Mr. Richberg told THE IRON AGE that limitation upon installation of new machinery is fundamentally contrary to NRA policy. Asked about reports that the iron and steel industry favors dropping of such limitations, Mr. Richberg said he did not know the attitude of the industry, but that NRA would not object to removing such limitations. Nor did he know anything as to the accuracy of reports that the steel industry will not seek continuance of its existing code provision against construction of new blast furnace, Bessemer converter and open-hearth capacity. There has been nothing disclosed here to indicate that the steel industry is ready to lift this ban, though Mr. Richberg made it clear NRA would be willing to see it removed.

Reports coming from sources outside of Washington have been to the effect that the steel industry as a whole still favors the limitation provision as to pig iron, Bessemer steel and open-hearth steel capacity. It was for this reason that it has been believed recommendation would be or has been made by the steel code authority against granting of an application made to NRA by the Northwestern Barb Wire Co., Sterling, Ill. The application asked for exemption from the code in order that the company could build open-hearth capacity.

Mr. Richberg said he did not think the restriction against new open-hearth capacity was especially vital at this time, in view of the present situation under which operations are only about 45 per cent of capacity. However, he said technological developments in the industry should not be discouraged through restrictions.

The restriction provision of codes comes under the two code classifications being studied, Mr. Richberg said. These classifications are labor practices and trade practices, the latter including several sub-classifications, the first being such unfair practices as fraud, bribery and false advertising, to be prosecuted through the courts. The second list includes production limitations, loss leaders, mark-ups, etc. These latter provisions, it was stated, may be proposed by a majority of the industry.

The Federal Trade Commission, under the plan, would handle violations of these provisions, "providing for an orderly procedure and not subjecting parties to penalty until the law is defined in each case." Nor would the Blue Eagle be removed.

Labor practices would include wages, hours, child labor provision and Section 7a.

Mr. Richberg said enforcement policies would be simplified and penalties would be limited to violation of labor provisions and the first group of trade practices.

This Week on the Assembly Line

(CONTINUED FROM PAGE 39)

and additional presses for fender and other sheet metal work are in operation at Kenosha. Nash's expenditures for heavy machinery, dies and small tools in the last six months have totaled $1,525,000.

Equipment Buying After June 1

Equipment makers are looking ahead to what promises to be fat orders from the automotive trade after June 1. Never in recent years have outstanding quotations bulked so large. Some of the pending business can be classed as expansion of capacity, as in the cases of Pontiac, Oldsmobile and Fisher Body. On the other hand, a good portion of it would fall under the general heading of "cost saving." With labor demanding more and more, car manufacturers are pruning operations here and there, substituting modern machinery for the older methods. Nothing much has been done yet in the purchase of equipment for Pontiac, Oldsmobile and Fisher Body at Pontiac. It is believed that action will be postponed until labor troubles in the ranks of General Motors are well ironed out.

Who's Buying the Cars?

Where have the phenomenal retail car sales come from? A considerable percentage has originated in the automobile industry itself and in industries dependent on it. Without special pressure being brought to bear, suppliers have been systematically solicited by some companies with satisfactory results. Pontiac, analyzing 3500 retail sales of its 1935 cars, discovered that salesmen had bought 16.8 per cent, professional men 15.9 per cent, executives 13.1 per cent and merchants 12.1 per cent. Perhaps it is a surprise to find factory workers fifth on the list, since there has been so much talk about the fact that industrial employees have recuperated little financially from depression's rigors.

Far down on the list are farmers, about whose restored buying power so much has been heard. It must be remembered, however, that national sales figures show that improvement over last year has been sharpest in agricultural districts. Farmers are heavy buyers of used cars, although few people are aware of this fact. Pontiac's survey revealed two other interesting things—51 per cent of the purchasers paid cash and 43.7 per cent of the cars traded in were over three years old.

Amendments to Steel Code Resolutions

REGULATION No. 2 of the iron and steel code has again been amended by the directors of the American Iron and Steel Institute, with reference to the sale of galvanized sheets for further manufacture into formed roofing. The regulations now permit a code member to allow deductions of $4 a ton on Nos. 26, 28 and 29 gage galvanized sheets and of $2 a ton on all other galvanized sheets which are intended for the manufacture of formed roofing. In addition, $2 a ton more may be allowed if the formed roofing products manufactured are intended for sale to jobbers.

Commercial Resolution No. A3 has been amended slightly with respect to deliveries of products by truck to places not reached by all-rail transportation.

Resolution A36, relating to reductions in the delivered prices of certain wire products upon the sale thereof in less-than-carload quantities, has also been revised, and now provides that no code member taking advantage of such price reductions as are contained therein is permitted to make any further deductions in delivered prices under the provisions of resolution A18.

Reinforcing Steel

Awards 1500 Tons—New Projects 3900 Tons

AWARDS

Hastings, N. Y., 200 tons, sewer, divided between National Bridge Works and Concrete Steel Co.

Union County, N. J., 200 tons, highway, to Igoe Brothers.

Denver, 200 tons, material for Bureau of Reclamation, Invitation 36088A, to Pacific Coast Steel Corpn.

Everett, Wash., 600 tons, mill for Weyerhaeuser Timber Co., to Pacific Coast Steel Corpn.

Seattle, 100 tons, five buildings for Alaska Road Commission, to Pacific Coast Steel Corpn.

Seattle, 172 tons, material for Railway Avenue seawall, to an unnamed bidder.

NEW REINFORCING BAR PROJECTS

New York, 230 tons, final foundation section of Tri-Borough bridge; bids due June 3.

New York, 1400 tons of reinforcing bars and 60 tons of steel curbing, plaza and approach for Manhattan side of Thirty-eighth Street tunnel under Hudson River; bids June 6.

Buffalo, 250 tons, grade-crossing for Erie Railroad; bids taken.

Olean, N. Y., 200 tons, high school; bids this week.

Campbell County, Ky., 125 tons, State highway bridge.

Beach City, Ohio, 100 tons, relocating tracks of Baltimore & Ohio Railroad in Muskingum District Conservation project; Cable Co., Canton, low bidder.

Zanesville, Ohio, 550 tons, Dover Dam in Muskingum District Conservation project; Bates & Rogers Construction Co. low bidder.

Columbus, Ohio, 600 tons, Main Street bridge; General Asphalt Paving Co., Canton, Ohio, low bidder for general contract.

State of Illinois, 600 tons, bridge; E. J. Albrecht, general contractor.

Sacramento, Cal., 124 tons, Montgomery Ward building; opening of bids postponed.

State of California, 112 tons, highway work in five counties.

Los Angeles, 100 tons, warehouse for California Walnut Growers Association; general contract awarded.

Portland, Ore., 103 tons, canal work on Owyhee project.

Pullman, Wash., 100 tons, dormitory at Washington State College; general contract awarded.

Seattle, 100 tons, material for Landsburg water system.

Cast Iron Pipe

Gardner, Mass., has awarded a tonnage of 12-in. to R. D. Wood & Co.

Cleveland, Tex., plans pipe lines for water system. Fund of $80,000 is being arranged for this and other waterworks equipment, and sewerage system. M. C. St. John, Esperson Building, Houston, Tex., is consulting engineer.

Longford, Kan., plans water pipe lines; also elevated steel tank and tower and other waterworks equipment. Bids will be asked early in June. Paulette & Wilson, Farmers' Union Building, Salina, Kan., are consulting engineers.

Princeton, Wis., has awarded 150 tons to James B. Clow & Sons.

Appleton, Wis., closes bids May 16 on 2000 ft. of 6-in. and 500 ft. of 8-in. class 250 centrifugal pipe.

Trempealeau, Wis., has engaged Walter S. Woods, consulting engineer, La Crosse, Wis., to design new waterworks plant and system costing about $50,000.

Omak, Wash., plans replacement and extensions in present water mains; also addition to municipal waterworks pumping station and installation of equipment. Fund of $17,400 is being arranged.

Jackson Center, Ohio, plans pipe lines for water system; also other waterworks construction. Fund of $35,410 has been secured through Federal aid. Edison Ellis, 115 Hazel Avenue, Lima, Ohio, is consulting engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 21 for 1600 ft. of cast iron soil pipe for Sewall's Point yard, and 650 ft. of water pipe for Brooklyn and Philadelphia yards (Schedule 5056).

Logansport, La., closes bids May 28 for 23,030 ft. of 2, 6 and 8-in. for water system; also for elevated steel tank and tower, and other waterworks equipment. Charles D. Evans, Shreveport, La., is consulting engineer.

Wentzville, Mo., asks bids until May 28 for water pipe lines, water softener plant and waterworks equipment. Russell & Axon, 4903 Delmar Boulevard, St. Louis, are consulting engineers.

Port Byron, N. Y., will take bids soon for about 50,000 ft. of 6 and 8-in. for water supply; also for storage tank and other waterworks equipment. Cost about $75,000. Solomon & Kies, 257 Broadway, Troy, N. Y., are consulting engineers.

Greenwood Electric Light & Water Plant, Greenwood, Miss., plans 8-in. submerged pipe line under Yazoo River at Greenwood for water trunk line.

Grand Marais, Minn., closes bids May 24 for pipe for water distribution and other waterworks installation. Pillsbury Engineering Co., 1200 Second Avenue South, Minneapolis, Minn., is consulting engineer.

Braymer, Mo., plans pipe for water system; also other waterworks equipment. Fund of $45,000 is being arranged. J. W. Shikles & Co., New York Life Building, Kansas City, Mo., are consulting engineers.

Chicago will open bids May 16 on 200 tons for Sanitary District.

Panguitch, Utah, has awarded 262 tons of 2 to 8-in. to Pacific States Cast Iron Pipe Co.

Oakland, Cal., has placed 552 tons of 6 to 12-in. with United States Pipe & Foundry Co.

Olympia, Wash., has awarded 500 tons to United States Pipe & Foundry Co.

Emerytown, Utah, has advanced bids on 235 tons of 2 to 6-in. to May 25.

Inglewood, Cal., has taken bids on 157 to 179 tons, on which United States Pipe & Foundry Co. is reported low bidder.

It All Depends On Who Does the Coercing

(From a radio address May 3, by Charles R. Hook, President, American Rolling Mill Co.)

SECTION 1 of the Wagner bill declares that it shall be the policy of the United States to give the worker "full freedom" in the designation of representatives of his own choosing, for the purpose of negotiating the terms and conditions of his employment. If I understand simple English, full freedom of choice by the employee in selecting his representative for collective bargaining means that the employee should be protected in that choice from all coercion from any source, either by employers or by outside labor organizations.

Senator Wagner, himself, at a hearing of his bill introduced in 1934, agreed that the employee should be protected from coercion from any source. Unfortunately, however, this promise is not fulfilled by his present bill, which protects the employee from coercion only by employers, and leaves him open to any sort of coercion, including physical violence and intimidation, by the representatives of outside labor unions.

Any bill of this character should absolutely protect the employee from coercion from any and all sources—anything else is unfair and un-American. If the Wagner bill were in good faith designed to prevent labor disputes, it would afford the employee this protection. The failure of Senator Wagner to write this into his new bill because of union opposition, and the fact that the bill is receiving support from the powerful American Federation of Labor lobby, is evidence of the real purpose of the bill. While urging the passage of the bill, the national unions have seen to it that their own organizations are exempted from all of its restrictive provisions.

COMING MEETINGS

May

National Electrical Manufacturers Association. May 19 to 23. Spring meeting, Homestead Hotel, Hot Springs, Va. R. J. Blais, 155 East Forty-fourth Street, New York, secretary.

National Association of Purchasing Agents. May 20 to 23. Annual convention and exhibit, Waldorf-Astoria Hotel, New York. George A. Renard, 11 Park Place, New York, secretary.

Porcelain Enamel Institute. May 22. Annual meeting, Statler Hotel, Cleveland. Kurt R. Groener, 612 North Michigan Avenue, Chicago, executive secretary.

American Iron and Steel Institute. May 23. General annual meeting, Hotel Commodore, New York. W. S. Tower, Empire State Building, New York, executive secretary.

June

Gray Iron Founders' Society. June 6 and 7. Industry meeting, Hotel Gibson, Cincinnati. H. M. Halsted, Jr., 1010 Public Square Building, Cleveland, executive vice-president.

Society of Automotive Engineers. June 16 to 20. Summer meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. John A. C. Warner, 29 West Thirty-ninth Street, secretary and general manager.

American Society of Mechanical Engineers. June 19 to 21. Summer meeting, Hotel Gibson, Cincinnati. C. E. Davies, 29 West Thirty-ninth Street, New York, secretary.

American Society for Testing Materials. June 24 to 28. Thirty-eighth annual meeting, Book-Cadillac Hotel, Detroit. C. L. Warwick, 260 Broad Street, Philadelphia, secretary.

Great Lakes Power Show. June 25 to 27. Steamer Seeandbee, Buffalo, June 25; Cleveland, June 26, and Detroit, June 27. Ernest H. Smith, 3910 Carnegie Avenue, Cleveland, manager.

Current Metal Working Activity Statistically Shown

These Data Are Assembled By THE IRON AGE From Recognized Sources And Are Changed Regularly As More Recent Figures Are Made Available. Boldface Type Indicates Changes This Week

	April, 1935	March, 1935	April, 1934	Four Months, 1934	Four Months, 1935
Raw Materials:					
Lake ore consumption (gross tons)[a]	.....	2,582,986	2,470,121	8,043,736	.....
Coke production (net tons)[b]	.....	3,012,692	2,947,051	11,283,303	.....
Pig Iron:					
Pig iron output—monthly (gross tons)[c]	**1,663,475**	1,770,028	1,726,851	5,825,284	6,519,391
Pig iron output—daily (gross tons)[c]	**55,449**	57,098	57,561	48,544	54,328
Castings:					
Malleable castings—production (net tons)[d]	.....	42,808	40,742	148,536	.....
Malleable castings—orders (net tons)[d]	.....	40,237	38,453	150,509	.....
Steel castings—production (net tons)[d]	.....	31,940	46,242	141,903	.....
Steel castings—orders (net tons)[d]	.....	30,723	63,142	185,182	.....
Steel Ingots:					
Steel ingot production—monthly (gross tons)[e]	**2,606,311**	2,830,700	2,897,529	9,819,314	11,013,306
Steel ingot production—daily (gross tons)[e]	**100,243**	108,873	115,901	95,517	106,906
Steel ingot production—per cent of capacity[e]	**45.28**	49.18	52.64	44.54	48.30
Employment in Steel Industry:					
Total employees[e]	.....	425,189	431,086	411,668	.....
Total payrolls (thousands of dollars)[e]	.....	46,764	45,472	157,038	.....
Average hours worked per week[e]	.....	33.9	34.4	32.9	.....
Finished Steel:					
Trackwork shipments (net tons)[e]	**4,399**	3,440	6,132	16,699	13,064
Sheet steel sales (net tons)[f]	.....	193,057	272,412	824,474	.....
Sheet steel production (net tons)[f]	.....	227,082	214,522	793,256	.....
Fabricated shape orders (net tons)[g]	.....	99,327	121,552	393,977	.....
Fabricated shape shipments (net tons)[g]	.....	82,410	82,194	253,054	.....
Fabricated plate orders (net tons)[d]	.....	16,832	20,085	89,547	.....
Reinforcing bar awards (net tons)[c]	**30,490**	17,335	22,685	73,985	85,690
U. S. Steel Corpn. shipments (tons)[h]	**591,728**	668,056	643,009	1,948,495	2,376,976
Ohio River steel shipments (net tons)[i]	.....	75,072	72,974	179,353	.....
Fabricated Products:					
Automobile production, U. S. and Canada[k]	***477,546**	451,805	378,983	1,141,121	*1,591,381
Construction contracts, 37 Eastern States[l]	.....	$123,043,500	.....	.....	.....
Steel barrel shipments (number)[d]	.....	.....	658,216	2,471,549	.....
Steel furniture shipments (dollars)[d]	.....	$1,220,533	$934,097	$3,780,644	.....
Steel boiler orders (sq. ft.)[d]	.....	655,812	440,562	1,115,729	.....
Locomotive orders (number)[m]	**2**	8	40	63	11
Freight car orders (number)[m]	**600**	0	750	21,649	1,430
Machine tool index[n]	**65.6**	62.3	46.5	†48.5	.....
Foundry equipment index[o]	.....	69.3	67.9	†67.7	†60.3
Foreign Trade:					
Total iron and steel imports (gross tons)[p]	.....	21,409	26,862	113,315	.....
Imports of pig iron (gross tons)[p]	.....	2,708	8,253	51,590	.....
Imports of all rolled steel (gross tons)[p]	.....	11,355	9,184	29,645	.....
Total iron and steel exports (gross tons)[p]	.....	323,035	201,539	792,015	.....
Exports of all rolled steel (gross tons)[p]	.....	78,483	71,882	314,442	.....
Exports of finished steel (gross tons)[p]	.....	68,146	68,785	296,179	.....
Exports of scrap (gross tons)[p]	.....	232,967	126,687	463,008	.....
British Production:					
British pig iron production (gross tons)[r]	**526,300**	553,200	496,300	1,855,600	2,083,800
British steel ingot production (gross tons)[r]	**808,700**	841,900	716,800	2,969,300	3,177,900
Non-Ferrous Metals:					
Lead production (net tons)[s]	.....	32,558	32,113	140,534	.....
Lead shipments (net tons)[s]	.....	28,960	30,673	120,683	.....
Zinc production (net tons)[t]	**35,334**	36,667[a]	30,686	127,904	140,713
Zinc shipments (net tons)[t]	**38,460**	41,137	32,072	124,090	150,038
Deliveries of tin (gross tons)[v]	**5,025**	5,495	4,405	14,490	19,025

*Preliminary. †Three Months' Average.

Sources of figures: [a] Lake Superior Iron Ore Association; [b] Bureau of Mines; [c] THE IRON AGE; [d] Bureau of the Census; [e] American Iron and Steel Institute; [f] National Association of Flat-Rolled Steel Manufacturers; [g] American Institute of Steel Construction; [h] United States Steel Corpn.; [i] United States Engineer, Pittsburgh; [k] When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; [l] F. W. Dodge Corpn.; [m] *Railway Age;* [n] National Machine Tool Builders Association; [o] Foundry Equipment Manufacturers Association; [p] Department of Commerce; [r] British Iron and Steel Federation; [s] American Bureau of Metal Statistics; [t] American Zinc Institute, Inc.; [v] New York Commodities Exchange.

Steel Rate Is Off But Scrap Advances Again

Settlement of Automobile Strike May Lift Mill Operations Before End Of Week—Swelling Exports Strengthen Scrap Market

STEEL production and scrap prices have again moved in opposite directions, output declining from 45½ to 44½ per cent of capacity and THE IRON AGE scrap index rising from $10.58 to $10.67 a ton. Swelling export demand, rather than domestic market conditions, accounts for the strength of scrap. Pittsburgh and Chicago prices are unchanged but at Philadelphia, closest to seaboard, the market for heavy melting steel has been lifted 25c. a ton.

Operating trends in steel centers, notwithstanding the decline of one point in the national average, are both conflicting and uncertain. The Pittsburgh rate has been lifted one point to 36 per cent, but the gain, which was due mainly to the rolling of the Erie rail order, is regarded as temporary. In the Chicago district, where farm equipment output is threatened by a fresh outbreak of strikes, the ingot rate is off 1½ points to 52 per cent. In the Cleveland-Lorain area there has been a further recession of two points to 43 per cent, and in the South operations have dipped 5½ points to 50 per cent.

In the Valleys, where production is unchanged at 51 per cent, and at Cleveland, operations may be lifted before the end of the week by the release of orders that have been under suspension because of labor difficulties in the automobile industry. Events alone can disclose how sharp this rebound will be, since it is believed that part of Chevrolet's prospective business was lost to competitors during the strike period. It is perhaps significant that recent steel releases from both Ford and Chrysler have been larger than anticipated.

A STRIKE at an Eastern shipyard is holding up work on seven Navy vessels and one oil tanker, representing a total value of about $40,000,000. A walkout in the Gogebic iron range which was scheduled for May 13 failed to take place. Petitions opposing the strike were signed by 96 per cent of the miners employed by the Oliver Iron Mining Co., Steel Corporation subsidiary.

The filing of iron and steel prices next Tuesday for third quarter delivery is expected to disclose few, if any, deviations from current quotations. The view that price schedules will be generally reaffirmed rather than advanced is supported by the extension of present prices of rails and track spikes to Sept. 1 for deliveries until Dec. 31.

Tin plate mills are maintaining production at 80 to 85 per cent. Leading can manufacturers are still planning for a peak year in packing. Domestic business in beer cans is now being supplemented by foreign demand for this new type of container. Sheet and strip mill operations are only moderately lower at 55 to 60 per cent and 45 per cent respectively. Pipe mills, benefiting by a gradual improvement in home building, are running at 40 to 45 per cent. Cold-finished bar makers are booking increased business from manufacturers of machine tools and business machines.

STRUCTURAL steel awards of 6700 tons compare with 10,200 tons in the previous week and 15,250 tons a fortnight ago. New projects total 18,125 tons as against 6000 tons a week ago. A Wabash Railway bridge will require 8000 tons, while the Manhattan approach of the Thirty-eighth Street tunnel under the Hudson will call for a total of 5000 tons, including reinforcing bars and miscellaneous steel items. New sheet steel piling projects, at 12,000 tons, embrace 9000 tons for the Fort Peck, Mont., dam and 1700 tons for a sea wall at Monroe, La.

Construction steel awards to date this year, including structural steel, plates, piling and reinforcing steel, total 404,063 tons as against 468,987 tons in the corresponding part of 1934. Large Federal-aid projects, however, are now being pushed to the contracting stage.

RAILROAD buying continues to lag far behind that of a year ago, though it is hoped that the Supreme Court's decision in the pension case will cause carriers to adopt a more liberal attitude toward purchases. The Delaware, Lackawanna & Western has ordered 850 tons of tie plates.

Discounts on cap and set screws have been advanced. Boat spikes have been placed on a nail base, reducing quotations 10c. to 20c. per 100 lb.

THE IRON AGE composite price for finished steel is unchanged at 2.124c. a lb. Adjustments for the freight surcharge have brought the pig iron composite down to $17.83 from $17.90 a ton.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

Per Gross Ton:	May 14, 1935	May 7, 1935	Apr. 16, 1935	May 15, 1934
No. 2 fdy., Philadelphia	**$20.3132**	$20.26	$20.26	$20.26
No. 2, Valley furnace	18.50	18.50	18.50	18.50
No. 2 Southern, Cin'ti	19.13	19.13	19.13	19.13
No. 2, Birmingham†	14.50	14.50	14.50	14.50
No. 2 foundry, Chicago*	18.50	18.50	18.50	18.50
Basic, del'd eastern Pa.	19.76	19.76	19.76	19.76
Basic, Valley furnace	18.00	18.00	18.00	18.00
Malleable, Chicago*	18.50	18.50	18.50	18.50
Malleable, Valley	18.50	18.50	18.50	18.50
L. S. charcoal, Chicago	24.2528	24.2528	24.04	24.04
Ferromanganese, seab'd carlots	85.00	85.00	85.00	85.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	$36.37½	$36.37½	$36.37½	$36.37½
Light rails, Pittsburgh	35.00	35.00	35.00	35.00
Rerolling billets, Pittsburgh	27.00	27.00	27.00	29.00
Sheet bars, Pittsburgh	28.00	28.00	28.00	30.00
Slabs, Pittsburgh	27.00	27.00	27.00	29.00
Forging billets, Pittsburgh	32.00	32.00	32.00	34.00
Wire rods, Pittsburgh	38.00	38.00	38.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh. lb.	1.70	1.70	1.70	1.70

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.80	1.80	1.80	1.90
Bars, Chicago	1.85	1.85	1.85	1.95
Bars, Cleveland	1.85	1.85	1.85	1.95
Bars, New York	2.15	2.15	2.13	2.23
Plates, Pittsburgh	1.80	1.80	1.80	1.85
Plates, Chicago	1.85	1.85	1.85	1.90
Plates, New York	2.09	2.09	2.08	2.13
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.85
Structural shapes, Chicago	1.85	1.85	1.85	1.90
Structural shapes, New York	2.06¼	2.06¼	2.05¼	2.10¼
Cold-finished bars, Pittsburgh	1.95	1.95	1.95	2.10
Hot-rolled strips, Pittsburgh	1.85	1.85	1.85	2.00
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.80

Finished Steel

Per Lb.:	May 14, 1935 Cents	May 7, 1935 Cents	Apr. 16, 1935 Cents	May 15, 1934 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.65
Hot-rolled annealed sheets, No. 24, Gary	2.50	2.50	2.50	2.75
Sheets, galv., No. 24, P'gh	3.10	3.10	3.10	3.25
Sheets, galv., No. 24, Gary	3.20	3.20	3.20	3.35
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	2.00
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	2.10
Wire nails, Pittsburgh	2.60	2.60	2.60	2.60
Wire nails, Chicago dist. mill	2.65	2.65	2.65	2.65
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.35
Barbed wire, galv., Pittsburgh	3.00	3.00	3.00	3.00
Barbed wire, galv., Chicago dist. mill	3.05	3.05	3.05	3.05
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.25

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$11.50	$11.50	$11.50	$12.75
Heavy melting steel, Phila.	**10.50**	10.25	10.00	11.25
Heavy melting steel, Chicago	10.00	10.00	9.75	11.00
Carwheels, Chicago	10.50	10.50	10.50	11.25
Carwheels, Philadelphia	11.25	11.25	11.25	12.75
No. 1 cast, Pittsburgh	12.75	12.75	12.25	13.25
No. 1 cast, Philadelphia	11.25	11.25	11.00	12.50
No. 1 cast, Ch'go (net ton)	9.00	9.00	9.00	9.00
No. 1 RR. wrot., Phila.	10.25	10.25	10.75	12.50
No. 1 RR. wrot., Ch'go (net)	8.00	8.00	8.00	8.75

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.85	$3.85	$3.85	$3.85
Foundry coke, prompt	4.60	4.60	4.60	4.60

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, refinery‡	8.75	8.75	8.75	8.25
Lake copper, New York‡	9.12½	9.12½	9.12½	8.62½
Tin (Straits), New York	**50.75**	50.50	51.12½	53.12½
Zinc, East St. Louis	4.20	4.20	4.07½	4.35
Zinc, New York	4.57½	4.57½	4.42½	4.70
Lead, St. Louis	**3.65**	3.60	3.55	4.10
Lead, New York	**3.80**	3.75	3.70	4.25
Antimony (Asiatic), N. Y.	14.25	14.25	14.25	8.60

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables. ‡Blue Eagle copper.

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
May 14, 1935	2.124c. a Lb.	$17.83 a Gross Ton	$10.67 a Gross Ton
One week ago	2.124c.	17.90	10.58
One month ago	2.124c.	17.90	10.42
One year ago	2.199c.	17.90	11.67
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel HIGH	Finished Steel LOW	Pig Iron HIGH	Pig Iron LOW	Steel Scrap HIGH	Steel Scrap LOW
1935	2.124c., Jan. 8	2.124c., Jan. 8	$17.90, Jan. 8	$17.83, May 14	$12.33, Jan. 8	$10.33, April 23
1934	2.199c., April 24	2.008c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	2.015c., Oct. 3	1.867c., April 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

Rail Order Lifts Pittsburgh Operations

Local Ingot Rate Is Up One Point to 36 Per Cent While Valley and Wheeling Rates Are Unchanged

PITTSBURGH, May 14.—Raw steel output in the Pittsburgh district this week has risen one point to 36 per cent. This change is the first recorded in nine weeks, but is not taken as an indication of a market trend. Rather is the higher output for the district ascribable to a fair rolling schedule at the local rail mill, which has begun engagement on the recent Erie Railroad rail order, and to moderately increased production at some units that had been slightly affected by the automotive strikes.

The lifting of the tension of labor troubles in the automotive industry is considered only one of many obstacles in the way of a clear course for steel activity. Too much unfinished business remains before Congress before producers will be able to shape future policies affecting both labor and finished steel prices. In the meantime the drift in discussions on prices has become indefinite, with the preponderant belief that current base quotations will hold.

The steadiness of activity in the Pittsburgh district is the most encouraging feature. Tin plate mills are maintaining production of 80 to 85 per cent, while sheet and strip output is only moderately lower at 55 to 60 per cent and 45 per cent respectively. Tube mills are holding at 40 to 45 per cent and wire mills are at 35 to 40 per cent.

Ingot production in the Valleys and nearby northern Ohio mills is scheduled at 51 per cent with a strong possibility of additional open-hearths being scheduled late in the week. Output in the Wheeling district is sustained at 77 per cent.

Pig Iron

Foundry demand is tapering, while interest in basic and Bessemer continues at a low point. Barge movement of steel-making grades to non-integrated mills is spotty. The Sharpsville, Pa., merchant stack was banked last week for an indefinite period. The rates from Neville Island of 63c. and 76c. to Pittsburgh district delivering points are now subject to the emergency freight surcharge. It has not yet been established whether the arbitrary switching rate of 50c. will also be subject to the increase.

Semi-Finished Steel

Sheet bar tonnage has been adversely affected by automotive labor difficulties. The movement of sheet bars for tin plate conversion, however, continues to be heavy and is accounting for a fairly well sustained aggregate volume of business. Demand for skelp has diminished. The movement of wire rods is lessening in line with seasonal tendencies. Forging stock is in fairly steady demand.

Rails and Track Accessories

Local producers of track fastenings have participated in the recent orders for track fastenings placed by Erie Railroad and Akron, Canton & Youngstown Railroad in conjunction with their large rail orders. The local rail mill has accumulated a small backlog, which probably will be depleted rather promptly.

Bolts, Nuts and Rivets

Orders thus far in May are falling slightly below volume in the corresponding period for April. The loss in bookings partly is due to reduced specifications by the automotive industry, although settlement of labor troubles may later release some tonnage now in deferment. Only scattered departures from present discounts are reported, with the leading producers attempting to maintain prices.

Reinforcing Steel

Aggregate orders are a shade heavier, but mill order books still are rather slim. A bulk storage station planned by the American Oil Co. for construction at Hays, Pa., may develop needs for a substantial tonnage of reinforcing steel, but specifications have not yet appeared.

Cold-Finished Bars

Shipments in the first half of May are practically equivalent to those in the first two weeks of April. Shipping suspensions from Chevrolet and Delco have held back a small tonnage, but favorable demand from other consuming groups has sustained the total movement. Improvement is noticeable in demand from machine tool and business machine manufacturers, while jobbers continue to appear more frequently in the market. No new developments with regard to the price situation are reported. Extension or revision of the steel code first must be settled before definite steps on the cold-finished bar price can be taken.

Plates and Shapes

The barge market is the liveliest spot for plates. A substantial tonnage for new bottoms is expected to be placed this week, and requests for bids have been issued at Washington for four steel barges. The American Oil Co.'s prospective plans for storage facilities at Hays, Pa., will include a substantial tonnage of plates for tank construction. The railroads are taking tonnage only for minor repairs.

Fresh structural steel inquiry is more diversified, with fresh specifications sprinkled with private projects. New work appearing in the last week, however, lacked importance from a tonnage standpoint. Awards reported here for the past week were small, but the encouraging feature was the inclusion of some industrial plants.

Tubular Products

Demand is holding to the recent pace, with sufficient business being booked to support average mill operations here at about 40 to 45 per cent. A small increase is noted in standard pipe orders for home building, while calls for oil-country goods are not decreasing. Heaviest drilling is reported in the east Texas and Gulf Coast fields. Some shipping suspensions, traceable to automotive strikes, have reduced the movement of mechanical tubing.

Bars

Incoming tonnage for May now is forging slightly ahead of that for the forepart of April, despite a reduced movement to the auto-

motive industry. Miscellaneous tonnage continues to be the chief support to this market, with demand from the agricultural implement makers also an important influence. Producers in this district at the present writing foresee no change in the current Pittsburgh base price for hot-rolled bars of 1.80c. a lb.

Wire Products

Demand has passed the usual seasonal bulge, although enough orders are coming in to maintain average operations in this district at 35 to 40 per cent. Shipments of manufacturers' wire have lagged as a result of the automotive labor troubles. Wire jobbers are placing replacement orders at a satisfactory rate. The possibility of a price advance for third quarter is becoming extremely remote.

Sheets

Sheet mill schedules in many instances still are suffering slightly from shipping suspensions occasioned by automotive labor trouble, and this week production for the sheet industry will average moderately lower at 55 to 60 per cent. Some sheets that have been held up owing to the automotive strike are being rolled against later delivery, and it is not considered likely that there will be ultimate loss of tonnage to sheet mills unless the strikes are prolonged. Miscellaneous orders, though smaller in the aggregate, are more diversified.

Tin Plate

Operations, for the time being, appear to be steadier at 80 to 85 per cent than they were a week ago. An influx of fairly heavy specifications during the past week has bolstered backlogs, and in some instances the current rate is assured for another three to four weeks. A larger percentage of current production, however, is being rolled for release later on. Leading can manufacturers still are planning for a peak year in packing. Export movement of beer cans is beginning to assume major importance in new developments, and may eventually match domestic beer markets as a new outlet for tin plate.

Coke and Coal

Production and shipments of bituminous coal have slumped badly. The Lake movement out of this district thus far in the present season has been discouragingly small. Part of the Lake demand is being supplied by distress tonnage, which is going at low prices. Further chaos in the price situation is believed assured if the proposed provision to eliminate price control for intrastate movement finds its way into the bituminous code. Furnace coke shipments have decreased, while foundry coke is moving steadily at a low rate. Beehive coke prices are fairly well maintained.

Strip Steel

Rolling schedules are slower as a result of shipping suspensions from Chevrolet. Other automotive releases are not decreasing, however, and miscellaneous tonnage is appearing in satisfactory volume. Demand from the farm implement makers is still a factor. Present output for the strip industry is averaging 45 per cent.

Scrap

Dealer covering against old orders represents the chief activity in this market. Continued strength still is traceable largely to high covering prices offered by a dealer who is bidding as high as $12.25 for No. 1 heavy melting steel for delivery to a mill in this district. The effect of the high bidding has been to prevent dealers with low-priced orders from covering anywhere near profitably. Dealers also are timid in offering additional tonnage to mills while the present high dealer bidding continues. Meanwhile mills in this district are manifesting little interest in scrap commitments, though in one or two instances early covering is expected. Machine shop turnings are stronger. Reduced production of compressed sheet steel during the automotive strikes has strengthened that grade moderately.

Blast Furnace Added in South

BIRMINGHAM, May 14. — Steel production in the South is unchanged, but production of merchant iron will be advanced slightly this week with the addition of one furnace. The Woodward Iron Co., which has been operating one furnace for several months, has added its No. 3 furnace to the list of active stacks. This furnace has been held banked for 19 months, which is believed to be a record for this district.

In addition to the two furnaces operated by the Woodward company, the Republic Steel Corpn. has two furnaces on merchant iron and the Sloss-Sheffield Steel & Iron Co., one.

The Tennessee Coal, Iron & Railroad Co. has two furnaces on mill iron at Fairfield, two on mill iron at Ensley and one at Ensley on recarbonizing metal. Production of pig iron in the district in April was slightly in excess of 122,000 tons, a little under March with the difference accounted for by the shorter month. Merchant production in May is expected to exceed April, though a loss is expected in mill iron production the latter part of May or the first of June.

The Tennessee company has four open-hearth furnaces in operation at Fairfield and four at Ensley. The Gulf States Steel Co. has three open-hearths operating in Gadsden. One of these is expected to be taken out of production for repairs next week, making the first material change in steel production in the district since Feb. 12.

Orders for cast iron pressure pipe are still limited to small lots, but the volume is sufficient to support a production in the district of around 40 per cent. There has been a light but scattered increase in structural steel business, but orders have not been sufficient to bring this industry up to the ingot production level of the district.

Demand Off in Southern Ohio

CINCINNATI, May 14.—Labor difficulties in the automotive industry have unsettled the district pig iron market. Jobbing foundries have reduced their melt in the face of reduced demand. Stove melters, however, are operating at good seasonal rate, and machine tool foundries are beginning to expand slowly. With dates for establishing prices near, the trade is generally uncertain, it being felt that some price advance may be made, though the recession of demand raises a question as to the advisability of such a move. Shipments of pig iron on contract, as well as fresh bookings, are down.

General demand for finished sheets adheres stubbornly to recent levels, but shipping suspensions on automotive orders have reduced total bookings to about 70 per cent of mill capacity. Inquiry for future requirements is nil, current activity still being restricted to early needs.

Foundry grades of coke continue to move at a level in keeping with seasonal tendencies.

Mill interests continue to exert pressure for lower scrap prices, making new sales unattractive to dealers. Some old material is moving on contract but the volume is not great. Prices are nominal in the absence of adequate test.

Chicago Rate Falls Back to 52 Per Cent

New Strikes Threaten Farm Equipment Output as Demand Shows Contra-seasonal Strength—Scrap Is Without Trend

CHICAGO, May 14.—The past seven days have witnessed some slight changes in the iron and steel market, one of which may become of major importance, and that is the labor situation. Workers at the Case plant at Racine, Wis., are still out, and new strikes have been started at Freeport, Ill., at shops which cater largely to farm implement manufacturers. The extension of industrial strife is unfortunate for the reason that crop conditions have measurably improved, and orders for farm equipment are turning upward at a between season time when they usually drop rather fast. Automobile production, if it can be gaged by specifications to Chicago mills, is slowly dropping, but its effect on ingot production is again partly offset by liberal releases from structural shops.

Ingot production now stands at 52 per cent of capacity, a drop of one and one-half points from a week ago. The loss of additional open-hearth furnaces hangs as a threat over mills, but this threat has been in sight for at least three weeks and for one cause or another the day of radical change has been postponed.

Pig Iron

Shipments are running close to the average in April, but the threat of labor trouble casts a cloud over nearby consuming points. New buying is dull, but this can be explained by the nearness of the third quarter contracting period. There is nothing definite to which one can tie in the matter of prices.

Structural Material

Although new orders and fresh inquiries remain very light, the effects of the bunching of orders on fabricators' books are still being felt. The result is that specifications entered at mills are close to the best of the year. Shops report that a total of 40,000 tons of inquiries is now on the active list and they estimate that fully 45,000 tons of other new business is in the making. The 2300 tons needed for the Ashland Avenue, Chicago, bridge has been awarded, and the steel for the Alton, Ill., dam may be placed next week, after having been held back by bookkeeping at Washington when it was necessary to transfer funds to meet the low bid.

Plates

Miscellaneous orders account for about 1500 tons, of which 900 tons has been taken by one tank shop. The railroad equipment market is very dull, and little steel is being used now in railroad shop repair programs. Tank builders in the Northwest, notably near the twin cities, report business the best in several years.

Rails

Actual orders are limited to 1000 tons of track supplies. The Chicago & Alton will undertake improvement of its tracks for high-speed train operation, but it is not known at this time if new rails will be needed. The Pere Marquette tonnage is still pending, and no further word has reached Chicago concerning a Canadian railroad's impending purchase of 8000 tons. Part of the Erie tonnage has been released for immediate rolling.

Sheets

Specifications are fairly steady from all sources with the exception that quite a number of miscellaneous users have started to take tonnages in excess of immediate requirements and to put them away for possible consumption in the third quarter. New buying remains light and backlogs are beginning to look thin in spots.

Bars

Tractor plants are putting on greater pressure for forging bars at a time when most other major consumers are taking smaller tonnages. Favorable crop weather throughout most of the Central West is being felt by farm implement manufacturers, who report that recent orders have been in better volume. Road machinery builders are steadily increasing production.

Wire Products

A moderate easing of demand is permitting mills to add to stocks, which are not only small, but out of balance. Woven wire fencing is slightly more active, and in some directions there is a better tone to the demand for manufacturers' wire. Use of electrical cables remains light, hopes for revival in this commodity hinging on the direction taken by Federal law makers.

Warehouse Business

Orders so far in May have been fewer in number than in the corresponding part of April. Warehouse men recognize this as a seasonal trend which marks the beginning of the summer slump. The volume of business done in April was far above that done in the corresponding month a year ago and it marked a large advance over the March, 1935, volume.

Cast Iron Pipe

Actual transactions remain rather few in number, but sellers are confident that the potential tonnage is large. The Sanitary District, Chicago, is in the market for 200 tons of specials and Princeton, Wis., has ordered 150 tons. Milwaukee and its neighbor, Fox Point, are taking bids on a total of 2000 tons. Prices are firm at $48.40 a net ton, delivered, Chicago on 6-in. and larger diameters.

Reinforcing Bars

Dealers are keeping busy on small inquiries but they are beginning to feel the absence of large jobs. The few large pending tonnages are unusually slow in coming to a head. An example of this is the 3300 tons for the Milwaukee filter plant. Bids have been taken twice and months have passed with the bars still not placed on shop books. The State of Illinois is asking for figures on bridge work and two small institutional buildings.

Scrap

Opinion is divided among dealers as to the price drift of this market. There is little in this immediate district that gives substance to arguments for higher prices. One mill withdrew an inquiry when it learned brokers' ideas as to prices, and another mill has stated flatly that it will not pay over $10 a ton for heavy melting steel. Yard scrap is slow in coming out, and many dealers, anxious to finish old orders, even at a loss, are bidding up railroad lists. Some in the trade are taking a long-range viewpoint and are trying to size up the ultimate effects of increasing exports.

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel	*Base per Lb.*
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
F.o.b. Duluth	1.95c.
Del'd Detroit	1.95c.
F.o.b. Cleveland	1.85c.
F.o.b. Buffalo	1.90c.
Del'd Philadelphia	2.11c.
Del'd New York	2.15c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Gary	1.75c.
F.o.b. Moline, Ill.	1.75c.
F.o.b. Cleveland	1.75c.
F.o.b. Buffalo	1.80c.
F.o.b. Birmingham	1.85c.
F.o.b. cars dock Gulf ports	2.10c.
F.o.b. cars dock Pacific ports	2.25c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	2.05c.
F.o.b. Chicago	2.10c.
F.o.b. Gary	2.10c.
Del'd Detroit	2.20c.
F.o.b. Cleveland	2.10c.
F.o.b. Youngstown	2.10c.
F.o.b. Buffalo	2.10c.
F.o.b. Birmingham	2.10c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.45c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago	1.95c.
F.o.b. Gary	1.95c.
F.o.b. Cleveland	1.95c.
F.o.b. Youngstown	1.95c.
F.o.b. Buffalo	1.95c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. cars dock Pacific ports	2.30c.

Iron

F.o.b. Chicago	1.80c.
F.o.b. Terre Haute, Ind.	1.75c.
F.o.b. Louisville, Ky.	2.10c.
F.o.b. Dansville, Pa.	1.80c.
F.o.b. Berwick, Pa.	1.70c.

Cold Finished Bars and Shafting*

	Base per Lb.
F.o.b. Pittsburgh	1.95c.
F.o.b. Chicago	2.00c.
F.o.b. Gary	2.00c.
F.o.b. Cleveland	2.00c.
F.o.b. Buffalo	2.05c.
Del'd Detroit	2.15c.
Del'd eastern Michigan	2.20c.

* In quantities of 10,000 to 19,000 lb.

Fence and Sign Posts

Angle Line Posts	*Base per Net Ton*
F.o.b. Pittsburgh	$50.00
F.o.b. Chicago	50.00
F.o.b. Duluth	51.00
F.o.b. Cleveland	50.00
F.o.b. Birmingham	53.00
F.o.b. Houston, Orange, Beaumont, Galveston	59.00
F.o.b. Mobile	58.00
F.o.b. New Orleans, Lake Charles, Corpus Christi	59.00
F.o.b. cars dock Pacific ports	63.00

Plates

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
Del'd Cleveland	1.995c.
F.o.b. Coatesville	1.90c.
F.o.b. Sparrows Point	1.90c.
Del'd Philadelphia	1.99c.
Del'd New York	2.09c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.
Wrought iron plates, f.o.b. P'gh	3.20c.

Floor Plates

F.o.b. Pittsburgh	3.35c.
F.o.b. Chicago	3.40c.
F.o.b. Coatesville	3.45c.
F.o.b. cars dock Gulf ports	3.75c.
F.o.b. cars dock Pacific ports	3.90c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
Del'd Cleveland	1.995c.
F.o.b. Buffalo	1.90c.
F.o.b. Bethlehem	1.90c.
Del'd Philadelphia	2.015c.
Del'd New York	2.0625c.
F.o.b. Birmingham (standard)	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.15c.
F.o.b. Chicago	2.25c.
F.o.b. Buffalo	2.25c.
F.o.b. cars dock Gulf ports	2.60c.
F.o.b. cars dock Pacific ports	2.60c.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.85c.
No. 10, f.o.b. Gary	1.95c.
No. 10, del'd Detroit	2.05c.
No. 10, del'd Phila.	2.16c.
No. 10, f.o.b. Birmingham	2.00c.
No. 10, f.o.b. dock cars Pacific ports	2.40c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.40c.
No. 24, f.o.b. Gary	2.50c.
No. 24, del'd Detroit	2.60c.
No. 24, del'd Phila.	2.71c.
No. 24, f.o.b. Birmingham	2.55c.
No. 24, f.o.b. dock cars Pacific ports	3.05c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.50c.
No. 10 gage, f.o.b. Gary	2.60c.
No. 10 gage, del'd Detroit	2.70c.
No. 10 gage, del'd Phila.	2.81c.
No. 10 gage, f.o.b. Birmingham	2.65c.
No. 10 gage, f.o.b. dock cars Pacific ports	3.10c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c.
No. 20 gage, f.o.b. Gary	3.05c.
No. 20 gage, del'd Detroit	3.15c.
No. 20 gage, del'd Phila.	3.26c.
No. 20 gage, f.o.b. Birmingham	3.10c.
No. 24, f.o.b. dock cars Pacific ports	3.50c.

Galvanized Sheets

No. 24, gage, f.o.b. Pittsburgh	3.10c.
No. 24, f.o.b. Gary	3.20c.
No. 24, del'd Phila.	3.41c.
No. 24, f.o.b. Birmingham	3.25c.
No. 24, f.o.b. dock cars Pacific ports	3.70c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	3.40c.
F.o.b. cars dock Pacific ports	4.10c.

Vitreous Enameling Stock

No. 20, f.o.b Pittsburgh	3.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.75c.
No. 28, Gary	2.85c.
No. 28, cars dock, Pacific Coast ports	3.35c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mill	$5.25
Standard cokes, f.o.b. Gary	5.35
Standard cokes, f.o.b. cars dock Pacific ports	5.90

Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

	Base per Lb.
All widths up to 24 in., P'gh	1.85c.
All widths up to 24 in., Chicago	1.95c.
All widths up to 24 in., del'd Detroit	2.05c.
All widths up to 24 in., Birmingham	2.00c.
Cooperage stock, Pittsburgh	2.10c.
Cooperage stock, Chicago	2.20c.

Cold-Rolled Strips

	Base per Lb.
F.o.b. Pittsburgh	2.60c.
F.o.b. Cleveland	2.60c.
Del'd Chicago	2.895c.
F.o.b. Worcester	2.80c.

Fender Stock

No. 14, Pittsburgh or Cleveland	2.90c.
No. 14, Worcester	3.30c.
No. 20, Pittsburgh or Cleveland	3.30c.
No. 20, Worcester	3.70c.

Hot-Rolled Rail Steel Strips

	Base per Lb.
F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Birmingham	1.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade	*Per Lb.*
Bright wire	2.30c.
Spring wire	2.90c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To Jobbing Trade

Qualified jobbers are entitled to a reduction of 20c. a 100 lb. from the base price on carload shipments to stock, and of 10c. a 100 lb. on less-carload shipments to stock.

	Base per Keg
Standard wire nails	$2.60
Smooth coated nails	2.60
Galvanized nails:	
15 gage and coarser	4.60
16 gage and finer	5.10

	Base per 100 Lb.
Annealed fence wire	$2.45
Galvanized fence wire	2.80
Polished staples	3.30
Galvanized staples	3.55
Barbed wire, galvanized	3.00
Woven wire fence, base column	63.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are $2 a ton over Pittsburgh (except for woven wire fence at Duluth which is $3 over Pittsburgh), and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire, staples and fence wire, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh, while Pacific Coast prices are $8 over Pittsburgh. Exception: on fence wire Pacific Coast prices are $11 a ton above Pittsburgh.

On staples and barbed wire, prices of $6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

Wire Hoops, Twisted or Welded

	Off List
F.o.b. Pittsburgh	35 and 2½ off
F.o.b. Chicago	35 off

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills

F.o.b. Pittsburgh only on wrought iron pipe

Butt Weld

Steel Inches	Black	Galv.	*Wrought Iron* Inches	Black	Galv.
⅛	51½	29½	⅛	+9	1½+13
¼ to ⅜	53½	35	¼ & ⅜	+1	½+21½
½	58½	47	½	31½	15
¾	62	52	¾	36½	20½
1 to 3	64	55	1 & 1¼	39½	25½
			1½	43½	28
			2	41½	26

Lap Weld

2	60	51	2	37	22½
2½ to 3	63	54	2½ to 3½	38	25
3½ to 6	65	56	4 to 8	40	28½
7 and 8	64	54	9 to 12	38	24½
9 and 10	63½	53½			
11 and 12	62½	52½			

Butt Weld, extra strong, plain ends

⅛	48½	33½	⅛	+13	+45½
¼ to ⅜	51	38	¼ & ⅜	+2½	+34½
½	56½	47½	½	32½	17½
¾	61	52	¾	37½	22½
1 to 3	63	55	1 to 2	43½	29

Lap Weld, extra strong, plain ends

2	58	50	2	40	26
2½ to 3	62	54	2½ to 4	45½	33
3½ to 6	65½	57½	4½ to 6	45	33½
7 and 8	64½	54½	7 & 8	46	33
9 and 10	63½	53½	9 to 12	41½	30
11 and 12	62½	52½			

On standard steel pipe an extra 5% off is allowed on sales to consumers while two 5's off apply on sales to jobbers. On less-than-carload shipments prices are determined by adding 20 and 25% and the carload freight rate to the base card. On structural steel pipe the base card is reduced 2 points and two 5's off are allowed to consumers and three 5's off to jobbers.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

			Cold Drawn	Hot Rolled
1 in. o.d.	13	B.W.G.	$ 8.60	$7.62
1¼ in. o.d.	13	B.W.G.	10.19	9.24
1½ in. o.d.	13	B.W.G.	11.26	10.23
1¾ in. o.d.	13	B.W.G.	12.81	11.64
2 in. o.d.	13	B.W.G.	14.35	13.04
2¼ in. o.d.	13	B.W.G.	16.00	14.54
2½ in. o.d.	12	B.W.G.	19.29	17.54
2¾ in. o.d.	12	B.W.G.	20.45	18.59
3 in. o.d.	12	B.W.G.	21.45	19.50
4½ in. o.d.	10	B.W.G.	41.08	37.35
3½ in. o.d.	11	B.W.G.	27.09	24.62
4 in. o.d.	10	B.W.G.	33.60	30.54
4½ in. o.d.	10	B.W.G.	41.08	37.35
5 in. o.d.	9	B.W.G.	51.56	46.87
6 in. o.d.	7	B.W.G.	79.15	71.96

Extras for less-carload quantities:

25,000 lb. or ft. to 39,999 lb. or ft.	5 %
10,000 lb or ft to 24,999 lb. or ft.	12½%
2,000 lb. or ft. to 9,999 lb. or ft.	25 %
Under 2,000 lb. or ft.	40 %

Lapweld Steel and Knobbled Charcoal Iron Pressure Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

			Steel	*Iron*
1½ in. o.d.	13	B.W.G.	$ 9.72	$20.16
1¾ in. o.d.	13	B.W.G.	11.06	21.84
2 in. o.d.	13	B.W.G.	12.38	17.23
2¼ in. o.d.	13	B.W.G.	13.79	19.58
2½ in. o.d.	12	B.W.G.	16.58	24.19
2¾ in. o.d.	12	B.W.G.	17.54	26.46
3 in. o.d.	12	B.W.G.	18.35	28.39
3¼ in. o.d.	11	B.W.G.	21.56	33.95
3½ in. o.d.	11	B.W.G.	23.15	36.16
4 in. o.d.	10	B.W.G.	28.66	45.36
4½ in. o.d.	10	B.W.G.	35.22	50.48
5 in. o.d.	9	B.W.G.	44.25	61.86
6 in. o.d.	7	B.W.G.	68.14	102.46

Quantity Extras:

40,000 lb. or ft.	base
25,000 lb. or ft. to 39,999 lb. or ft.	plus 5%
10,000 lb. or ft. to 24,999 lb. or ft.	plus 12½%
2,000 lb. or ft. to 9,999 lb. or ft.	plus 25%
Under 2,000 lb. or ft.	plus 40%

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago	$48.40
*4-in., del'd Chicago	51.40
6-in. and larger, del'd New York	45.60
4-in. del'd New York	48.60
*6-in. and larger, Birmingham	40.60
*4-in. Birmingham	43.00

Class "A" and gas pipe, $3 extra.

*Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $39, Birmingham, and $47.40, delivered Chicago, and 4-in. pipe $42, Birmingham, and $50.40 a ton, delivered Chicago.

RAILROAD MATERIALS

Rails and Track Supplies F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$36.27½
Angle bars, per 100 lb.	2.55

F.o.b. Code Basing Points

Light rails (from billets) per gross ton	$35.00
Light rails (from rail steel) per gross ton	34.00

	Base per 100 Lbs.
Spikes, 9/16 in. and larger	$2.40
Spikes, ½ in. and smaller	2.40
Spikes, boat and barge	2.40
Tie plates steel	1.90
Tie plates, Pacific Coast ports	2.00
Track bolts, to steam railroads	3.55
Track bolts, no jobbers, all sizes (per 100 count)	70 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Buffalo, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; on spikes alone, Cleveland, Youngstown, Lebanon, Pa., Columbia, Pa., Richmond, Va., Jersey City, N. J.

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine bolts	70, 10 and 5
Carriage bolts	70, 10 and 5
Lag bolts	70, 10 and 5
Flow bolts, Nos. 1, 2, 3 and 7 heads	70, 10 and 5
Hot-pressed nuts, blank or tapped, square	70, 10 and 5
Hot-pressed nuts, blank or tapped, hexagons	70, 10 and 5
C.p.c. and t. square or hex. nuts, blank or tapped	70, 10 and 5
Semi-finished hexagon nuts, U.S.S., all sizes	70, 10 and 5
Semi-finished hexagon nuts, S.A.E. ¼ in. to 7/16 in. diameter	70, 10 and 5
⅛ in. to 1 in. diameter	70, 10 and 5
larger than 1 in. diameter	70, 10 and 5
Stove bolts in packages, Pittsburgh	75
Stove bolts in packages, Chicago	75
Stove bolts in packages, Cleveland	75
Stove bolts in bulk, Pittsburgh	83
Stove bolts in bulk, Chicago	83
Stove bolts in bulk, Cleveland	83
Tire bolts	60 and 5

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.90
F.o.b. Chicago	3.00
F.o.b. Birmingham	3.05

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 5
F.o.b. Cleveland	70 and 5
F.o.b. Chicago and Birm'g'm	70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller	85
Milled standard set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread ⅜ in. and smaller	75
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller	87½
Upset set screw, cut and oval point	80
Milled studs	65 to 65 and 10

Alloy and Stainless Steel

Alloy Steel Ingots

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Uncropped .....$40 per gross ton

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Base price, $49 a gross ton.

Alloy Steel Bars

Price del'd Detroit is $52.

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton. Open-hearth grade, base .....2.45c. Delivered price at Detroit is.....2.60c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
2000 (½% Nickel)	$0.25
2100 (2½% Nickel)	0.55
2300 (3½% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.20
6100 Chromium Vanadium Spring Steel	0.70
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars is ¼c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 2.95c. base per lb.

STAINLESS STEEL No. 302

(17 to 19% Cr. 7 to 9% Ni. 0.08 to 0.20% C.)

(Base Prices, f.o.b. Pittsburgh)

	Per Lb.
Forging billets	19.55c.
Rerolling slabs	15c.
Bars	23c.
Plates	26c.
Structural shapes	23c.
Sheets	33c.
Hot-rolled strip	20¾c.
Cold-rolled strip	27c.
Drawn wire	23c.

Raw and Semi-Finished Steel

Carbon Steel Rerolling Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Uncropped .....$29 per gross ton

Carbon Steel Forging Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Birmingham. Uncropped .....$31 per gross ton

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.

	Per Gross Ton
Rerolling	$27.00
Forging quality	32.00

Delivered Detroit

Rerolling	$30.00
Forging	35.00

Billets Only F.o.b. Duluth

Rerolling	$29.00
Forging	34.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or Bessemer	$28.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved	1.70c.
Universal	1.70c.
Sheared	1.70c.

Tube Rounds

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Cleveland	1.85c.
F.o.b. Buffalo	1.90c.
F.o.b. Birmingham	1.95c.

Wire Rods

(Common, base)

	Per Gross Ton
F.o.b. Pittsburgh	$38.00
F.o.b. Cleveland	38.00
F.o.b. Chicago	39.00
F.o.b. Anderson, Ind.	39.00
F.o.b. Youngstown	39.00
F.o.b. Worcester, Mass.	40.00
F.o.b. Birmingham	41.00
F.o.b. San Francisco	47.00
F.o.b. Galveston	44.00

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Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	$19.50	$20.00	$19.00	$20.50
Bethlehem, Pa.	19.50	20.00	19.00	20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Swedeland, Pa.	19.50	20.00	19.00	20.50
Steelton, Pa.	....	....	19.00	....
Sparrows Point, Md.	19.50	....	19.00	....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Youngstown	18.50	18.50	18.00	19.00
Buffalo	18.50	19.00	17.50	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Cleveland	18.50	18.50	18.00	19.00
Toledo, Ohio	18.50	18.50	18.00	19.00
Jackson, Ohio	20.25	20.25	19.75	....
Detroit	18.50	18.50	18.00	19.00
Hamilton, Ohio	18.50	18.50	18.00	19.00
Chicago	18.50	18.50	18.00	19.00
Granite City, Ill.	18.50	18.50	18.00	....
Duluth, Minn.	19.00	19.00	....	19.50
Birmingham	14.50	14.50	13.50	19.00
Provo, Utah	17.50	....	17.00	....

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District From Everett, Mass.	$20.00	$20.50	$19.50	$21.00
Brooklyn From East. Pa.	21.9289	22.4289	21.9289	22.9289
Newark or Jersey City, N. J. From East. Pa.	20.9873	21.4873	20.4873	21.9873
Philadelphia From Eastern Pa.	20.3132	20.8132	19.8132	21.3132
Cincinnati From Hamilton, Ohio	19.51	19.51	19.01	20.01
Canton, Ohio From Cleveland and Youngstown	19.76	19.76	19.26	20.26
Columbus, Ohio From Hamilton, Ohio	20.50	20.50	....	....
Mansfield, Ohio From Cleveland and Toledo	20.26	20.26	....	....
Indianapolis From Hamilton, Ohio	20.93	20.93	....	....
South Bend, Ind. From Chicago	20.6935	20.6935	....	....
Milwaukee From Chicago	19.57	19.57	....	....
St. Paul From Duluth	20.94	....	....	....
Davenport, Iowa From Chicago	20.3832	20.3832	....	....
Kansas City From Granite City	21.2178	21.2178	....	....

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y. $23.50

GRAY FORGE PIG IRON

Valley furnace	$18.00
Pittsburgh district furnace	18.00

CHARCOAL PIG IRON

Lake Superior furnace	$21.00
Delivered Chicago	24.2528
Delivered Buffalo	24.57

CANADA

Pig Iron

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	21.00

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

	Per Gross Ton
Domestic, 80% (carload)	$85.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$26.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50% (carloads)	$77.50
50% (ton lots)	85.00
75% (carloads	126.00
75% (ton lots)	136.00

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
6%	$22.75	12%	$29.25
7%	23.75	13%	30.75
8%	24.75	14%	32.25
9%	25.75	15%	33.75
10%	26.75	16%	35.25
11%	27.75	17%	36.75

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10%	$27.75	14%	$33.25
11%	28.75	15%	34.75
12%	30.25	16%	36.25
13%	31.75	17%	37.75

Manganese 1½ to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W. del., carloads	$1.35 to $1.45
Ferrotungsten, less carloads	1.45 to 1.55
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr. per lb. contained Cr. delivered, in carloads	10.00c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del. per lb. contained V.	$2.70 to $2.90
Ferrocarbontitanium, 15 to 18% Ti, 6 to 8% C, f.o.b. furnace carload and contract per net ton.	$137.50
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with $2 unitage	50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with $2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	$38.00
Ton lots or less per ton	45.50
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	90.00
2% carbon grade	95.00
1% carbon grade	105.00
Spot prices	$5 a ton higher

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	**$11.25 to $11.75**
No. 2 heavy melting steel	10.00 to 10.50
No. 2 railroad wrought	**11.25 to 11.75**
Scrap rails	11.50 to 12.00
Rails, 3 ft. and under	12.75 to 13.25
Compressed sheet steel	11.25 to 11.75
Hand bundled sheet steel	**10.00 to 10.50**
Hvy. steel axle turnings	**10.00 to 10.50**
Machine shop turnings	8.00 to 8.50
Short shov. turnings	8.00 to 8.50
Short mixed borings and turnings	**6.00 to 6.50**
Cast iron borings	**6.00 to 6.50**
Cast iron carwheels	**12.00 to 12.50**
Heavy breakable cast	11.50 to 12.00
No. 1 cast	12.50 to 13.00
Railr. knuckles and couplers	14.00 to 14.50
Rail, coil and leaf springs	**14.00 to 14.50**
Rolled steel wheels	**14.00 to 14.50**
Low phos. billet crops	15.00 to 15.50
Low phos. sheet bar crops	**14.25 to 14.75**
Low phos. plate scrap	**14.00 to 14.50**
Low phos. punchings	14.00 to 14.50
Steel car axles	**14.25 to 14.75**

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	$9.75 to $10.25
Automobile hvy. melt. steel	**9.00 to 9.50**
Shoveling steel	9.75 to 10.25
Hydraulic comp. sheets	**8.50 to 9.00**
Drop forge flashings	7.50 to 8.00
No. 1 busheling	**8.25 to 8.75**
Rolled carwheels	11.00 to 11.50
Railroad tires	**11.50 to 12.00**
Railroad leaf springs	**10.50 to 11.00**
Axle turnings	9.00 to 9.50
Steel couplers and knuckles	**11.00 to 11.50**
Coil springs	**12.00 to 12.50**
Axle turnings (elec. fur.)	9.50 to 10.00
Low phos. punchings	12.50 to 13.00
Low phos. plates, 12 in. and under	**12.50 to 13.00**
Cast iron borings	5.00 to 5.50
Short shoveling turnings	5.00 to 5.50
Machine shop turnings	4.50 to 5.00
Rerolling rails	11.00 to 11.50
Steel rails, less than 3 ft.	**12.00 to 12.50**
Steel rails, less than 2 ft.	**12.50 to 13.00**
Angle bars, steel	11.25 to 11.75
Cast iron carwheels	10.50 to 11.00
Railroad malleable	13.00 to 13.50
Agricultural malleable	9.50 to 10.00

	Per Net Ton
Iron car axles	$14.50 to $15.00
Steel car axles	**13.50 to 14.00**
No. 1 railroad wrought	8.00 to 8.50
No. 2 railroad wrought	8.50 to 9.00
No. 2 busheling	4.50 to 5.00
Locomotive tires, smooth	10.00 to 10.50
Pipe and flues	5.00 to 5.50
No. 1 machinery cast	**9.00 to 9.50**
Clean automobile cast	8.50 to 9.00
No. 1 railroad cast	**8.00 to 8.50**
No. 1 agricultural cast	**8.00 to 8.50**
Stove plate	6.00 to 6.50
Grate bars	**5.50 to 6.00**
Brake shoes	6.00 to 6.50

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	*$9.50 to $10.50
No. 2 heavy melting steel	*8.50 to 9.50
No. 1 railroad wrought	10.00 to 10.50
Bundled sheets	**9.50 to 10.00**
Hydraulic compressed, new	9.50 to 10.00
Hydraulic compressed, old	7.00 to 7.50
Machine shop turnings	**5.50 to 6.00**
Heavy axle turnings	**8.50 to 9.00**
Cast borings	**5.00 to 5.50**
Stove plate (steel works)	**8.00 to 8.25**
Heavy breakable cast	10.50
No. 1 low phos. heavy	13.75 to 14.25
Couplers and knuckles	13.50 to 14.00
Rolled steel wheels	13.50 to 14.00
No. 1 blast furnace	4.75 to 5.00
Spec. iron and steel pipe	**8.00 to 8.50**
Shafting	17.00
Steel axles	**16.00**
No. 1 forge fire	**9.50 to 10.00**
Cast iron carwheels	11.00 to 11.50
No. 1 cast	11.00 to 11.50
Cast borings (chem.)	12.00 to 14.00
Steel rails for rolling	12.00 to 12.50

* Brokers' buying price for export.

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	**$7.50 to $8.00**
No. 2 heavy melting steel	**6.00 to 6.50**
Scrap rails for melting	7.50 to 8.00
Loose sheet clippings	4.00 to 4.50
Bundled sheets	5.50 to 6.00
Cast iron borings	4.00 to 4.50
Machine shop turnings	4.00 to 4.50
No. 1 busheling	5.50 to 6.00
No. 2 busheling	2.25 to 2.75
Rails for rolling	8.50 to 9.00
No. 1 locomotive tires	6.75 to 7.25
Short rails	11.00 to 11.50
Cast iron carwheels	**7.50 to 8.00**
No. 1 machinery cast	8.75 to 9.25
No. 1 railroad cast	8.00 to 8.50
Burnt cast	5.50 to 6.00
Stove plate	5.50 to 6.00
Agricultural malleable	7.50 to 8.00
Railroad malleable	8.50 to 9.00

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$9.75 to $10.25
No. 2 heavy melting steel	9.25 to 9.75
Compressed sheet steel	9.25 to 9.75
Light bundled sheet stampings	7.00 to 7.50
Drop forge flashings	8.00 to 8.50
Machine shop turnings	5.00 to 5.50
Short shoveling turnings	6.00 to 6.50
No. 1 busheling	8.50 to 9.00
Steel axle turnings	8.50 to 9.00
Low phos. billet crops	14.00 to 14.50
Cast iron borings	6.25 to 6.75
Mixed borings and short turnings	6.25 to 6.75
No. 2 busheling	6.25 to 6.75
No. 1 cast	11.50 to 12.00
Railroad grate bars	7.00 to 7.50
Stove plate	7.25 to 7.75
Rails under 3 ft.	14.00 to 14.50
Rails for rolling	15.50 to 18.00
Railroad malleable	13.00 to 13.50
Cast iron carwheels	10.75 to 11.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	$10.00
No. 2 heavy melting scrap	$8.50 to 9.00
Scrap rails	11.00
New hydraul. comp. sheets	8.50 to 9.00
Old hydraul. comp. sheets	7.50 to 8.00
Drop forge flashings	8.50 to 9.00
No. 1 busheling	8.50 to 9.00
Hvy. steel axle turnings	8.00 to 8.50
Machine shop turnings	4.50 to 5.00
Knuckles and couplers	11.50 to 12.00
Coil and leaf springs	11.50 to 12.00
Rolled steel wheels	11.50 to 12.00
Low phos. billet crops	12.00 to 12.50
Short shov. steel turnings	6.00 to 6.50
Short mixed borings and turnings	6.00 to 6.50
Cast iron borings	6.00 to 6.50
No. 2 busheling	6.50
Steel car axles	11.50 to 12.00
Iron axles	11.50 to 12.00
No. 1 machinery cast	11.00 to 11.50
No. 1 cupola cast	10.00 to 10.50
Stove plate	9.00 to 9.50
Steel rails, 3 ft. and under	12.50 to 13.00
Cast iron carwheels	11.00 to 11.50
Industrial malleable	12.00 to 13.00
Railroad malleable	12.00 to 13.00
Chemical borings	8.00 to 8.50

BOSTON

Dealers' buying prices per gross ton:

*No. 1 heavy melting steel	$8.50
No. 1 heavy melting steel	$5.40 to 6.00
*Scrap T rails	8.50
*No. 2 steel	7.50
No. 2 steel	4.75 to 5.00
Breakable cast	4.75 to 5.00
Machine shop turnings	1.75 to 1.90
*Machine shop turnings (short)	4.00 to 4.50
Bundled skeleton, long	4.75 to 5.00
Forge flashings	4.75 to 5.50
Mixed borings and turnings	1.00 to 1.50
Shafting	**12.00 to 12.50**
Steel car axles	11.50 to 12.00
Cast iron borings, chemical	6.50 to 7.00
*Stove plate	5.50 to 6.00

Per gross ton delivered consumers' yards:

Textile cast	$9.00 to $9.50
No. 1 machinery cast	9.00 to 9.50
Stove plate	6.00 to 6.50
Railroad malleable	**11.00 to 11.50**

* Delivered local army base.

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	*$7.00 to †$8.50
No. 2 heavy melting steel	*5.50 to †7.00
Heavy breakable cast	6.25 to 6.75
No. 1 machinery cast	7.00 to 7.50
No. 2 cast	6.25
Stove plate	6.25
Steel car axles	13.50 to 14.00
No. 1 railroad wrought	7.00 to 7.50
No. 1 yard wrought, long	6.00 to 6.50
Spec. iron and steel pipe	4.50 to 5.00
Forge fire	5.50 to 6.00
Rails for rolling	8.50 to 9.00
Short shoveling turnings	2.00 to 2.50
Machine shop turnings	2.00 to 2.50
Cast borings	3.50 to 3.75
No. 1 blast furnace	2.00 to 2.50
Cast borings (chemical)	11.00 to 11.50
Unprepared yard iron and steel	4.00 to 4.50

Per gross ton, delivered local foundries:

No. 1 machinery cast	$10.00
No. 1 hvy. cast (cupola size)	9.00
No. 2 cast	7.50

* For direct car loading only.
† Loading on barge.

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	$9.00 to $9.50
Scrap steel rails	10.00 to 10.50
Short shoveling turnings	7.00
Stove plates	7.00
Steel axles	11.50
Iron axles	11.50
No. 1 railroad wrought	7.00
Rails for rolling	12.50
No. 1 cast	9.50 to 10.00
Tramcar wheels	10.00

ST. LOUIS

Per gross ton delivered consumers' yards:

Selected heavy steel	$8.50 to $9.00
No. 1 heavy melting	8.00 to 8.50
No. 2 heavy melting	7.00 to 7.50
No. 1 locomotive tires	9.75 to 10.25
Misc. stand-sec. rails	9.25 to 9.50
Railroad springs	9.50 to 10.00
Bundled sheets	6.00 to 6.50
No. 2 railroad wrought	8.00 to 8.50
No. 1 busheling	5.00 to 5.50
Cast iron borings and shoveling turnings	3.00 to 3.50
Rails for rolling	10.00 to 10.50
Machine shop turnings	2.75 to 3.25
Heavy turnings	5.50 to 6.00
Steel car axles	12.50 to 13.00
Iron car axles	15.00 to 16.00
No. 1 railroad wrought	6.00 to 6.50
Steel rails less than 3 ft.	11.50 to 12.00
Steel angle bars	9.50 to 10.00
Cast iron carwheels	7.00 to 7.50
No. 1 machinery cast	8.50 to 9.00
Railroad malleable	9.50 to 10.00
No. 1 railroad cast	8.00 to 8.50
Stove plate	6.50 to 7.00
Agricult. malleable	8.50 to 9.00

DETROIT

Dealers' buying prices per gross ton:

Heavy melting steel	$7.50 to $8.00
Borings and short turnings	4.00 to 4.50
Long turnings	$3.50 to $4.00
No. 1 machinery cast	10.25 to 10.75
Automotive cast	10.75 to 11.25
Hydraul. comp. sheets	7.75 to 8.25
Stove plate	6.50 to 7.00
New factory bushelling	6.50 to 7.00
Old No. 2 busheling	3.75 to 4.25
Sheet clippings	4.50 to 5.00
Flashings	6.75 to 7.25
Low phos. plate scrap	7.50 to 8.00

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$7.00	$7.00
Rails scrap	8.00	8.00
Machine shop turnings	3.00	3.00
Boiler plate	4.50	4.50
Heavy axle turnings	4.50	4.00
Cast borings	4.00	3.50
Steel borings	2.00	2.00
Wrought pipe	3.50	3.50
Steel axles	7.00	8.00
Axles, wrought iron	7.00	8.00
No. 1 machinery cast	9.00	9.00
Stove plate	5.50	5.00
Standard carwheels	7.25	7.00
Malleable	6.75	7.00

ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

Lake Superior Ores

Delivered Lower Lake Ports

	Per Gross Ton
Old range, Bessemer, 51.50% iron	$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer, 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore

C.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algeria	9.50c.
Iron, low phos., Swedish, average 68½% iron	9.50c.
Iron, basic or foundry, Swedish, aver. 65% iron	9c.
Iron, basic or foundry, Russian, aver. 65% iron	9c.
Manganese, Caucasian, washed 52%	26c.
Manganese, African, Indian, 44-48%	21c.
Manganese, African, Indian, 49-51%	24c.
Manganese, Brazilian, 46 to 48½%	20c.

	Per Net Ton Unit
Tungsten, Chinese, wolframite, duty paid, delivered*	$17.50 to $18.50
Tungsten, domestic, scheelite, delivered†	17.00

	Per Gross Ton
Chrome, 45%, Cr_2O_3, crude, c.i.f. Atlantic Seaboard	$17.00
Chrome, 48%, Cr_2O_3, c.i.f. Atlantic Seaboard	20.00

* Quotations nominal in absence of sales.
† Nominal; no supplies available.

Fluorspar

	Per Net Ton
Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines for all-rail shipment	$13.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings	16.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	14.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	19.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	30.00

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville Prompt	$3.85
Foundry, f.o.b. Connellsville Prompt	$4.60 to 5.10
Foundry, by-product, Chicago ovens, for delivery outside switching district	8.50
Foundry, by-product, delivered in Chicago switching district	9.25
Foundry, by-product, New England, delivered	11.00
Foundry, by-product, Newark or Jersey City, del'd	9.20 to 9.65
Foundry, by-product, Phila.	9.00
Foundry, by-product, Cleveland, delivered	$9.25
Foundry, Birmingham	6.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.80 to $2.05
Mine run coking coal, f.o.b. W. Pa.	2.05 to 2.25
Gas coal, ¾-in., f.o.b. Pa. mines	2.25 to 2.55
Mine run gas coal, f.o.b. Pa. mines	2.05 to 2.45
Steam slack, f.o.b. W. Pa. mines	1.55 to 1.65
Gas slack, f.o.b. W. Pa. mines	1.90 to 2.10

Fuel Oil

Per Gal. f.o.b. Bayonne, N. J.	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. f.o.b. Baltimore	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. del'd Chicago	
No. 3 industrial fuel oil	3.88c.
No. 5 industrial fuel oil	3.38c.
Per Gal. f.o.b. Cleveland	
No. 3 distillate	5.50c.
No. 4 industrial	5.25c.
No. 5 industrial	4.25c.

REFRACTORIES

Fire Clay Brick

	Per 1000 f.o.b. Works High-heat Duty Brick	Intermediate Duty Brick
Pennsylvania	$45.00	$40.00
Maryland	45.00	40.00
New Jersey	55.00	45.00
Ohio	45.00	40.00
Kentucky	45.00	40.00
Missouri	45.00	40.00
Illinois	45.00	40.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$45.00
Chicago District	54.00
Birmingham	55.00
Silica clay, per net ton	8.00

Chrome Brick

	Per Net Ton
Standard, f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	$45.00
Chemically Bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	42.50

Magnesite Brick

	Per Net Ton
Standard, f.o.b. Baltimore and Chester, Pa.	$65.00
Chemically Bonded, f.o.b. Baltimore	55.00

Grain Magnesite

	Per Net Ton
Imported, f.o.b. Baltimore and Chester, Pa.	$45.00
Domestic, f.o.b. Baltimore and Chester	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.90c.
Cold-finished and screw stock:	
Rounds and hexagons	3.20c.
Squares and flats	3.20c.
Hoops and bands under ¼ in.	3.20c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more bundles	3.95c.
Hot-rolled sheets (No. 10)	2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$3.69
Spikes, large	2.90c.
Track bolts, all sizes, per 100 count,	65 per cent off list.
Machine bolts, 100 counts,	65 per cent off list.
Carriage bolts, 100 count,	65 per cent off list.
Nuts, all styles, 100 count,	65 per cent off list.
Large rivets, base per 100 lb.	$3.50
Wire, black, soft ann'l'd, base per 100 lb.	*2.70
Wire, galv. soft, base per 100 lb.	*2.925
Common wire nails, per keg	*2.834
Cement coated nails, per keg	*2.834

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.20c.
Soft steel bars	2.95c.
Cold-fin. steel bars:	
Rounds and hexagons	3.35c.
Flats and squares	3.35c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.55c.
Hot-rolled sheets (No. 10)	3.05c.
Spikes (keg lots)	3.50c.
Track bolts (keg lots)	4.65c.
Rivets, structural (keg lots)	3.65c.
Rivets, boiler (keg lots)	3.75c.
	Per Cent Off List
Machine bolts	*70
Carriage bolts	*70
Lag screws	*70
Hot-pressed nuts, sq. tap. or	
Hot-pressed nuts, sq. tap or blank	*70
Hot-pressed nuts, hex. tap or	
Hot-pressed nuts, hex. tap or blank	*70
Hex. head cap screws	80
Cut point set screws	70 and 10
Flat head bright wood screws	37½ and 10
Spring cotters	50
Stove bolts in full packages	70
Rd. hd. tank rivets, 7/16 in. and smaller	57½
Wrought washers	$4.50 off list
Black ann'l'd wire per 100 lb.	$3.85
Com. wire nails, base per keg	2.95†
Cement c't'd nails, base per keg	2.95†

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 65 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b., Chicago, with full or partial freight allowed up to 50c. per 100 lb.

†Prices for city and suburbs only.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, small shapes	3.26c.
Iron bars	3.26c.
Iron bars, swed, charcoal	6.50c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.81c.
Flats and squares	4.31c.
Cold-rolled; strip, soft and quarter hard	3.36c.
Hoops	3.56c.
Bands	3.56c.
Hot-rolled sheet (No. 10)	3.31c.
Hot-rolled ann'l'd sheets (No. 24*)	3.89c.
Galvanized sheets (No. 24*)	4.50c.
Long terne sheets (No. 24)	5.20c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.40c.
Wire, galv. (No. 10)	3.75c.
Tire steel, 1 x ½ in. and larger	3.65c.
Open hearth spring steel	4.00c. to 10.00c.
Common wire nails, base, per keg	$3.21
	Per Cent
Machine bolts, cut thread:	Off List
All diameters	65 and 10
Carriage bolts, cut thread:	
All diameters	65 and 10
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.44c.
Bars, soft steel or iron	3.19c.
Cold-fin. rounds, shafting, screw stocks	3.74c.
Hot-rolled annealed sheets (No. 24)	4.09c.
Galv. sheets (No. 24)	4.64c.
Hot-rolled sheets (No. 10)	3.29c.
Black corrug. sheets (No. 24)	4.09c.
*Galv. corrug. sheets	4.64c.
Structural rivets	3.99c.
Boiler rivets	4.09c.
	Per Cent Off List
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws fittings up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts:	
All quantities	70

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	2.95c.
*Structural shapes	2.95c.
*Soft steel bars, small shapes, iron bars (except bands)	2.90c.
‡Reinforc. steel bars, sq. twisted and deformed	2.955c.
Cold-finished steel bars	3.73c.
*Steel hoops	3.40c.
*Steel bands, No. 12 and 3/16 in., incl.	3.15c.
Spring steel	5.00c.
†Hot-rolled anneal. sheets (No. 24)	3.55c.
†Galvanized sheets (No. 24)	4.25c.
*Hot-rolled annealed sheets (No. 10)	3.05c.
Diam. pat. floor plates, ¼ in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.31c.
Soft steel bars	2.95c.
Reinforc. steel bars	2.10c.
Cold-finished steel bars	3.25c.
Flat-rolled steel under ¼ in.	3.36c.
Cold-finished strip	†3.00c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 24)	4.61c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c.
Black ann'l'd wire, per 100 lb.	$2.65
No. 9 galv. wire, per 100 lb.	3.00
Com. wire nails, base per keg	2.40

†Outside delivery 10c. less.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.42c.
Bars, soft steel or iron	3.17c.
New billet reinforc. bars	3.25c.
Rail steel reinforc. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.47c.
Cold-finished bars	3.57c.
Hot-rolled annealed sheets (No. 24)	4.02c.
Galv. sheets (No. 24)	4.72c.
Hot-rolled sheets (No. 10)	3.22c.
Structural rivets	4.35c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$2.88
Com. wire nails, base per keg:	
Any quantity less than carload	3.04
Cement c't'd nails, base 100-lb. keg	3.50
Chain, 1-in., per 100 lb.	8.35
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$21.67
4-in.	51.19
Lap-welded steel boiler tubes, 2-in.	20.62
4-in.	48.19

BUFFALO

	Base per Lb.
Plates	3.37c.
Struc. shapes	3.25c.
Soft. steel bars	3.00c.
Reinforcing bars	2.60c.
Cold-fin. flats and sq.	3.55c.
Round and hex.	3.55c.
Cold-rolled strip steel	3.19c.
Hot-rolled annealed sheets (No. 24)	4.05c.
Heavy hot-rolled sheets, 3/16 in., 24 to 48 in. wide	3.62c.
Galv. sheets (No. 24)	4.70c.
Bands	3.42c.
Hoops	3.42c.
Hot-rolled unannealed sheets	3.17c.
Com. wire nails, base per keg	$3.35
Black wire, base per 100 lb.	3.55

BOSTON

	Base per Lb.
Beams, channels, angles, tees, zees	3.55c.
H beams and shapes	3.55c.
Plates—sheered, tank and univ. mill, ¼ in. thick and heavier	3.56c.
Floor plates, diamond pattern	5.36c.
Bar and bar shapes (mild steel)	3.35c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.65c. to 4.65c.
Half rounds, half ovals, ovals and bevels	4.60c.
Tire steel	4.60c.
Cold-rolled strip steel	3.245c.
Cold-finished rounds, squares and hexagons	3.90c.
Cold-finished flats	3.75c.
Blue annealed sheets, No. 10 ga.	3.65c.
One pass cold-rolled sheets No. 24 ga.	4.20c.
Galvanized steel sheets, No. 24 ga.	4.90c.
Lead coated sheets, No. 24 ga.	5.85c.

Prices delivered by truck in metropolitan Boston, subject to quantity differentials.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.31c.
Soft steel bars	3.06c.
Hot-rolled strip	3.41c.
Hot-rolled sheets (No. 10)	3.16c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 24)	4.66c.
Cold-finished steel bars	3.61c.
Cold-rolled strip	3.30c.
Structural rivets (keg lots)	3.86c.
Boiler rivets (keg lots)	3.96c.
Track spikes (keg lots)	3.71c.
Track bolts (keg lots)	4.86c.
Black annealed wire	3.10c.
Com. wire nails	2.90c.
Cement coated nails	2.90c.
	Per Cent Off List
Machine bolts	70
Carriage bolts	70
Hot-pressed nuts, sq. and hex., tapped or blank (keg lots)	70

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on order of 400 to 3499 lb. On cold-finished bars the prices are for orders of 300 to 499 lb.

PACIFIC COAST

	Base per Lb.		
	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	3.55c.	3.60c.	3.55c.
Shapes, standard	3.55c.	3.60c.	3.55c.
Soft steel bars	3.60c.	3.60c.	3.60c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.45c.	2.45c.	2.45c.
Hot-rolled annealed sheets (No. 24)	4.40c.	4.35c.	4.40c.
Hot-rolled sheets (No. 10)	3.75c.	3.70c.	3.75c.
Galv. sheets (No. 24)	5.00c.	4.95c.	5.00c.
Cold finished steel:			
Rounds	5.95c.	5.85c.	6.00c.
Squares and hexagons	7.20c.	7.10c.	7.25c.
Flats	7.70c.	7.60c.	8.25c.
Common wire nails —base per keg			
less carload	$3.30	$3.40	$3.30

All items subject to differentials for quantity.

TOOL STEEL

Prices are same for warehouse distribution at all points on or East of Mississippi River. West of Mississippi quotations are 1c. a lb. higher.

	Base per Lb.
High speed	57c.
High carbon chrome	37c.
Oil hardening	22c.
Extra	17c.
Regular	14c.

Weekly Indications of Steel Activity

From The Iron Age

	May 14, 1935	May 7, 1935	Apr. 16, 1935	May 15, 1934	Average, Year to Date, 1935	1934
Steel-ingot operations—Per cent of capacity	44.5	45.5	46.5	61.0	48.3	45.6

	Week Ended				Year to Date	
	May 14, 1935	May 7, 1935	Apr. 16, 1935	May 15, 1934	1935	1934
Fabricated structural steel awards	6,700	10,200	32,025	15,800	263,688	320,195
Fabricated plate awards	1,495	500	4,410	6,450	37,980	44,892
Sheet steel piling awards	1,200	0	150	0	13,165	20,670
Reinforcing bar awards	1,500	2,040	16,955	4,625	89,230	83,470

Building Prospects Improve In New York District

Gradual Revival of Private Construction Is Hopeful Sign as Plans for Large Public Projects Are Expedited

NEW YORK, May 14.—Total bookings of finished steel continue to decline, but the recession is less marked than had been expected. Tin plate releases are holding up well, although in smaller volume than last month, and private construction is showing gradual, though non-spectacular, improvement. Scattered awards of small churches, factories and store buildings are helping to support the demand for reinforcing bars and to a lesser extent for structural steel. Increasing residential construction is reflected mainly in enlarged consumption of steel pipe and sheets.

Pipe resale prices are becoming more and more demoralized. Efforts at enforcement have apparently ceased; seemingly the Steel Institute is refraining from taking affirmative action of any kind that might arouse antagonism pending settlement of the fate of the code.

While much of the reinforcing and structural steel going into smaller construction projects is of foreign origin or is second hand material, the steel trade is genuinely encouraged by scattered evidences of an impending revival of private building. The outlook in the residential field is said to be especially promising, provided present political uncertainties diminish, and it is reported that various interests promoting the uses of prefabricated homes will soon hold a conference to plan a concerted drive to put over the steel house, starting late in the year.

The decision of the Supreme Court in the railroad pension case has revived interest among the carriers in rolling stock and track work. Several railroads have increased shop operations. The Delaware, Lackawanna & Western has placed 850 tons of tie plates with Carnegie Steel Co. The Goodyear-Zeppelin Corpn., Akron, Ohio, has been asked to quote on another streamlined passenger train for the New York, New Haven & Hartford.

Bids will be taken June 6 on the Manhattan plaza and approach for the Thirty-eighth Street (midtown) tunnel under the Hudson River. About 5000 tons of steel will be required, including 1400 tons of reinforcing steel, 890 tons of structural steel tunnel lining as an alternate for cast iron segments, 2050 tons of carbon structural steel, 173 tons of silicon steel, 250 tons of roadway beams, 60 tons of steel curbing, and miscellaneous tonnages of sheets, etc., for ducts and pipes. The East River extension of the Thirty-eighth Street tunnel has been authorized in a bill signed by the Governor and will probably come up for bids early in the summer. The original plan of extending the tunnel below Manhattan Island has been abandoned and it is possible an elevated structure will be built instead.

The Triborough Bridge Authority is working on preliminary designs for a bulkhead extending from Ninety-second Street to 122nd Street along the East River. Several thousand tons of sheet steel piling will be required. The municipal dock department is surveying city docks along the Hudson River between Twenty-third and Forty-second Streets with a view to spending $13,000,000 for necessary improvements. Municipalities along the Jersey coast have joined forces with State authorities to obtain Federal funds for shore protection.

Pig Iron

Melting volume in this territory is practically unchanged, and founders are seemingly uninterested in the possibility of a price increase for third quarter. New bookings continue to involve only carlots for nearby shipment, with little or no demand for coverage over two months ahead. Total bookings of local sellers during the week amounted to 1150 tons, as compared with 1350 tons a week earlier and 1500 tons sold two weeks ago.

Reinforcing Steel

Small-lot demands are slightly above those of a month ago. Likewise, the outlook for large tonnages is more encouraging. A grade crossing elimination on Staten Island, N. Y., will require 1800 tons of bars, bids will close on June 3 for 230 tons for the final foundation section of the Tri-Borough Bridge, and the Manhattan plaza and approach for the Midtown Tunnel will require 1400 tons of bars, on which tenders are due June 6. Awards during the week consisted of 200 tons for a Hastings, N. Y., sewer, divided between National Bridge Works and Concrete Steel Co., and a Union County, N. J., highway, for which 200 tons will be supplied by Igoe Brothers.

Scrap

Broker purchases of heavy breakable cast for Harrisburg, Pa., delivery have been in sufficient volume to raise the price here 50c. a ton. Otherwise the domestic market is dull, but quite firm from a price standpoint. The export market is now as active as ever following the lull of last month occasioned by an acute shortage of Japanese bottoms. No. 1 and No. 2 steels are still being purchased in truck lots alongside barges at $8.50 and $7 a ton respectively, with 25c. more being paid in some instances to dealers delivering sizable quantities. A boat will clear today with scrap rails for Japan, several other boats are currently loading steel for Japan, and boats are loading cast iron and stove plate for Britain. Although Japanese export houses are currently not as anxious for new tonnages as they were several months ago, most local brokers have sufficient orders on books at the present time to carry them through the next two months.

Bids Asked at St. Louis On Large Bridge

ST. LOUIS, May 14.—Bids have been asked for June 12 for the superstructure of the Wabash Railway bridge over the Missouri River near St. Charles, Mo., requiring 8000 tons of structural steel. The St. Louis Shipbuilding & Steel Co. has been awarded a contract for 71 pontoons, involving 800 tons of plates, for the United States Engineer's office at Vicksburg, Miss. Buying of finished steel is slightly more active than for the last several weeks in a number of lines, although the movement of wire products and roofing materials for agricultural consumption has been rather slow as a result of heavy rains.

The stove manufacturing trade is experiencing a lull at present,

and buying is not so brisk as it was at this time last year because of the fact that operations were stepped up considerably last May in anticipation of an increase in wages which became effective in June. Both sales and shipments of pig iron are light. Producers are still feeling the effects of the heavy movement in anticipation of the emergency freight advance.

Although buying of scrap iron is light and neither dealers nor melters show any interest in the market, this week will be marked by the closing of several heavy railroad lists, including 35,000 tons to be sold by the Louisville & Nashville, its first offering in six months, which is expected to go to Eastern markets; the Wabash, 6000 tons, representing an accumulation of 60 days, and the Missouri-Kansas-Texas, 1000 tons. A Missouri Pacific offering of 100 carloads is said to have gone to Kansas City and other Western markets. A stronger interest is reported for railroad malleable. Prices are nominally unchanged.

Buffalo Output At 30 Per Cent

BUFFALO, May 14.—The Lackawanna plant of the Bethlehem Steel Corpn. added one open-hearth to its active list late last week, making seven now in operation. Republic Steel Corpn. is operating three on full time, and Wickwire-Spencer Corpn., one. The Seneca sheet division of Bethlehem is running at about 75 per cent.

The Carborundum Co., Niagara Falls, will erect an addition to require 100 tons of fabricated structural steel. A grade crossing in Buffalo near William and New South Ogden Streets will require 250 tons of reinforcing steel and bids will be taken May 15. Tenders will be received this week on 200 tons of reinforcing bars and wire mesh for a new Olean high school.

Pig iron business has dropped off somewhat compared to last month.

A sale of No. 1 and No. 2 heavy melting steel to a local mill was a feature of the week's scrap business. Between 2000 and 3000 tons was sold at $10 and $9 for the No. 1 and No. 2 respectively. An outside dealer that took most of the order is said to be offering $9 to dealers for No. 1 steel, with few takers. Dealers prefer to accumulate at the present time rather than sell; they are convinced scrap prices are going higher. They call attention to the report of 250,000 tons exported during March and the firmness of quoted prices.

Output in Cleveland Area Drops to 43 Per Cent

But Steel Demand Is Expected to Rebound With Strike Settlement — Ore Strike Averted — Cap Screws Reduced

CLEVELAND, May 14.—With the settlement of the labor troubles at the Chevrolet Motor Co., the demand for finished steel in the automobile industry is expected to snap back quickly to the volume that was coming out before operations of several Chevrolet plants were suspended. The Fisher Body plant in Cleveland probably will resume operations in a day or two, although a definite decision as to time of starting up has not yet been made. This resumption will result in the immediate release of large shipments of sheet and strip steel by Ohio mills. As all shipments were held up when the plant was shut down, stocks have not accumulated at the Fisher plant.

Ingot output in the Cleveland-Lorain territory further declined two points this week to 43 per cent of capacity. While each of the local steel plants took off an open-hearth, one additional furnace was put on in Lorain.

Although sheet and strip mills have suffered from the General Motors labor troubles, miscellaneous orders are holding up fairly well in other lines and the volume of business with several mills so far this month is equal to the corresponding period in April. While activity in the construction field depends largely on public work, there has been some increase in private projects.

The emergency freight rates on intrastate shipments in Ohio will be placed in effect June 1. The advance was ordered at the conclusion of a hearing in Columbus today.

Pig Iron

Shipments so far this month are slightly heavier than during the corresponding period of April, but there is little new business. Consumers are buying only in small lots for immediate needs. Shipments by merchant furnaces were little affected by the suspension of Chevrolet automobile production, as their iron has been going to foundries making castings for other makes of cars, the General Motors Corpn. still having considerable iron in stock. Demand from makers of heating equipment is tapering. Although the cost of making pig iron will be increased approximately 50c. a ton by the advance in freight rates, the present price probably will be reaffirmed for the third quarter. Prices for that delivery will be filed May 21.

Sheets

Considerable business continues to come from the automotive industry, although shipments to the local Fisher Body plant and to Chevrolet plants are still held up. The local mill is operating at 65 per cent of capacity this week. A local stamping plant during the week placed a good order for sheets for Plymouth running boards. Refrigerator manufacturers continue to maintain good production schedules, but their orders for sheets are not so heavy as recently. Miscellaneous demand for enameling sheets continues very active. Little business is coming from barrel manufacturers. The Newton Steel Co. expects to resume the operation late in the week of its Monroe, Mich., plant, which has been shut down by a strike.

Strip Steel

While the suspension of the manufacture of Chevrolet cars resulted in considerable restriction in shipments, orders from makers of parts of other motor cars are well maintained. Miscellaneous demand is dull.

Iron Ore

Danger of labor troubles in the Gogebic district seems to have subsided somewhat, as union strike agitators have not been very successful in lining up miners to make demands under threat of a strike. In the meantime a strike that was scheduled to start Monday, did not materialize. A very strong sentiment against a strike has developed in the Gogebic district, and more than 96 per cent of the miners employed by the Oliver Iron Mining Co., United States

Steel Corpn. subsidiary, have signed petitions declaring that they are opposed to a strike. Efforts have been made to enlist the employees on the ore docks at Ashland, Wis., in the strike movement, but have failed.

Ore shipments from Lake Erie docks during April were 470,041 tons as against 416,225 tons during the same month last year. Most of this was dock ore, as April receipts were only 118,883 tons. Dock balance at Lake Erie ports May 1 was 4,173,204 tons, as compared with 4,570,626 tons on the same date last year.

Bolts, Nuts and Rivets

Price reductions have been made on cap and set screws by advancing the discount. Weakness in prices on these products has been in evidence for some time. Headless set screws and milled studs are unchanged. Demand for bolts and nuts has declined largely because of the Chevrolet labor troubles.

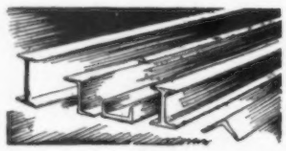
Bars, Plates and Shapes

Public work requiring 4500 tons of structural steel, reinforcing bars and steel piling for which bids for the general contracts have been taken are awaiting awards in this territory. New private work includes 700 tons of structural steel for a new plant for the Greer Steel Co., Anderson, Ind. For the Dover Dam of the Muskingum, Ohio, conservation district, requiring 550 tons of bars and 450 tons of piling, the Bates & Rogers Construction Co. was low bidder, and for the Main Street bridge, Columbus, taking 600 tons of bars and 790 tons of piling, the General Asphalt Paving Co., Canton, was low bidder. The contract for the blower building for the easterly sewage disposal plant, Cleveland, which was held up for months awaiting receipt of Federal funds, will be placed this week with the Hunkin-Conkey Construction Co., Cleveland, and this will release 360 tons of reinforcing bars which will go to a Cleveland fabricator. Demand for steel bars has continued to taper, largely because of the Chevrolet strike.

Scrap

The market is firm, but there is an absence of new business from consumers. Dealers are buying some heavy melting steel for Youngstown delivery paying $10.75 to $11 for No. 1 and $10 to $10.25 for No. 2. As mills recently bought this scrap at $11 for No. 1 and $10.25 for No. 2, dealers covering at the top price are only breaking even. There is some activity in compressed sheet steel scrap for Steubenville delivery.

Philadelphia Steel Users Await Code Developments



Second Quarter Prices Will Probably Be Extended—Scrap Market Very Firm —Strike Paralyzes Local Shipbuilder

PHILADELPHIA, May 14. — As in other districts, steels sellers and users here are intensely interested in three questions—what will third quarter prices be? What action will be taken on the steel code? When will PWA funds be distributed?

Practically all mill representatives here are of the opinion that second quarter prices will be reaffirmed with few or no exceptions, despite the higher freight costs which mills have recently been forced to absorb. One indication that prices will not be changed is the recent action of mills in extending the delivery date on rails, track spikes and tie plates to Dec. 31 on all tonnages ordered prior to Sept. 1.

Although most of the trade here looks for the open price filing policy to be extended in some form, many consumers are delaying purchases in the hope that some change favorable to them may occur. Inasmuch as this district has a large capacity for plates and building materials, it has suffered considerably by the protracted delay in State highway construction. Thus, it is believed that only the release of PWA funds to nearby States will serve to lift district operations above a 35 per cent level.

Alan Wood and Worth Steel Co. are each operating two open-hearths, but rolling operations are not in a volume sufficient to take care of the increased output. Likewise, Pencoyd continues to operate on a minimum schedule of three furnaces and one small structural mill. Other mill operations are about unchanged from a week ago and the district rate is approximately 32 per cent of capacity.

The 4200 employees of the New York Shipbuilding Co. are now on a strike with the result that $4?,-000,000 worth of work is being delayed. Shipments of steel to the seven navy vessels and one tanker being built at this plant are temporarily held up.

Pig Iron

The exceptionally quiet condition of this market is expected to continue until some action is taken on third quarter prices and some assurance is forthcoming as to the fate of the steel code. Blast furnaces have experienced cost advances averaging 35c. per ton as the result of emergency freight charges. Nevertheless it is unlikely that this higher cost will be passed on to the consumer. A price rise would be particularly dangerous in this area because of the constant competition of low-priced foreign iron.

Sheets and Strip

Large users are delaying forward purchases until some announcement is made as to third quarter prices. Miscellaneous demand, however, is still in fair volume, with manufacturers of steel window sashes in the market for larger tonnages. This latter industry is currently operating at least 35 per cent better than during the same period a year ago. Local autobody stamping plants continue to restrict purchases as a result of lighter shipments of bodies to automobile strike areas. Seasonal light tank work is accounting for heavier shipments of blue-annealed sheets and light plates, but tonnages moving to this outlet continue to be considerably under expectations.

Bars, Plates and Shapes

There are indications of a gradual increase in private demands for building materials. Likewise, sellers are now figuring on more tonnage lots. The one award of shapes during the week consisted of 218 tons for a Campbell Soup Co. building, which will be supplied by Morris Wheeler & Co., Inc. Pending jobs include 100 tons for a Reading Railroad bridge in Columbia County, Pa., on which tenders are due May 21, and 400 tons for a Charlotte, N. C., post office, on which bids are due May 21. It is expected that the Downingtown, Pa., Paper Box company will ask for bids in about three weeks on a new building, for which 400 tons of shapes will be required. The reinforcing bar market continues al-

most inactive, but bids will be taken May 17 on about 100 tons for a building for Lenning Chemical Co., Philadelphia. Plate sellers continue to subsist on spotty miscellaneous demands with little or no tonnage business in prospect. Pusey & Jones Corpn. will purchase 440 tons of plates and shapes in about ten days for a lightship, and Sun Shipbuilding Co. expects to open bids on 400 tons of plates and shapes for the Erie ferryboat during the next week. No definite contract has yet been awarded on the two tankers for Gulf Refining Co.

Imports

The following iron and steel imports were received here last week: 1237 tons of pig iron from British India and 15 tons of ferromanganese from France.

Scrap

Mills in this area continue to ignore the scrap market. Nevertheless the price undertone is remarkably steady with indications toward firmness mostly as the result of strength in the Pittsburgh district and steady liquidation of the export accumulations which have been overhanging this immediate territory. More than 13,000 tons of steel have been moved from Port Richmond since the first of the month, and about 10,000 tons more will clear before the end of the week. Inasmuch as brokers are finding it easier to obtain ships, it is unlikely that the export market will suffer any decline for some months to come. Domestically, the scrap market continues lethargic. Brokers are buying turnings, No. 2 steel and heavy cast at $6, $8.50 and $10.50 respectively for Coatesville delivery. Also, the steady purchases of No. 2 steel for Claymont have resulted in a particularly strong position for this grade.

Large Jobs Pending On Coast

SAN FRANCISCO, May 13. — Awards of major steel tonnages are being withheld, although in several cases general contracts have been placed. Bookings are expected shortly at San Francisco for the 3033 tons of reinforcing bars, 2800 tons of structural steel and 330 tons of pipe railing required for the Trans-Bay bridge distribution structure. The report that Ingalls Iron Co. is in line for the structural tonnage could not be confirmed.

American Concrete & Steel Pipe Co. is reported to be the low bidder on the Mad River dam and pipe line which is to be constructed near Eureka, Cal. Approximately 1300 to 2000 tons of plates, 500 tons of reinforcing bars and 100 tons of structural steel are specified. At Denver, Colo., an award should be made soon on the 1327 tons of sheet piling required in the Cherry Creek retarding dam.

The Los Angeles Department of Water and Power is expected to make awards during the coming week to cover the next quarter's cast iron pipe requirements which total 5150 tons. United States Pipe & Foundry Co. expects to take 3700 tons, while the remaining 1450 tons will probably be divided between National Cast Iron Pipe Co. and American Cast Iron Pipe Co.

Pacific Coast Steel Corpn. recently booked 1200 tons of sheet piling for the Railway Avenue seawall, which is being constructed at Seattle, Wash. At Los Angeles, the same company took 850 tons of structural steel for a warehouse. Consolidated Steel Corpn. was awarded 250 tons of shapes for a school administration building at Long Beach, Cal.

While improvement is being noted in all areas on the Pacific Coast, the reappearance of a limited number of industrial projects is especially encouraging. Mill production continues steady and warehouse business is showing favorable gains.

Canadian Mill Books Large Rail Order

TORONTO, Ont., May 14.—New business in the Canadian iron and steel markets continues to show steady expansion. The Dominion Steel & Coal Corpn., Sydney, N. S., has received an order from the South African Government for 10,000 tons of steel rails. The Steel Co. of Canada, Hamilton, Ont., is maintaining an operating schedule of better than 50 per cent, with some departments at capacity. Algoma Steel Corpn., Sault Ste. Marie, Ont., also has closed some good orders recently, but its operations are below those of the other two companies.

Foundries have increased daily melt and are now averaging better than 40 per cent of capacity. The automotive industry is responsible for a good part of the current demand for steel products, and manufacturers of electric stoves and refrigerators are purchasing good quantities of sheets. Substantial orders are appearing at regular intervals from the mining industry. Building trades are gradually improving, and there has been some pickup in sales of structural steel. Tenders are being received by the Hon. F. M. MacPherson, Minister of Public Works, Victoria, B. C., for the construction of a $4,000,000 steel bridge across the Fraser River at New Westminster, according to J. A. Collins, managing director of the Fraser River Bridge Co.

Pig iron production is sustained, with three stacks blowing and output about 1200 tons daily. Imports are confined to small tonnage lots of special grades from the United States. Prices are firm and unchanged.

Sales of steel scrap have gained considerably of late and regular shipments of heavy melting steel are being made to the mills in the Hamilton district. In the Montreal market, dealers report a stronger demand for steel scrap, with a fair market for wrought iron and steel axles. It also is understood that Montreal dealers have closed contracts for steel scrap for shipment to Britain and deliveries will start in the early future. Dealers are considering revision of price lists and some are paying above the market for desirable lots.

Boston Export Scrap Prices Are Firmer

BOSTON, May 14.—Local interest in scrap centers in the export market, with prices very firm. For No. 1 steel, $8.50 a ton, delivered Army base, has been paid; for No. 2 steel, $7.50; for engine blocks, $6.50, and for scrap rails, $8.50. Recent shipments included 328 tons of scrap brake shoes and 672 bundles of scrap tin plate to Japan, and 7402 tons of scrap to Civita Vecchia, Italy. Purchases of scrap for New England consumption are largely in truck-load lots.

Pig iron buying is on a limited scale, and the melt is decreasing rather than increasing.

Angle bars for heavy rails made from axle steel will be quoted at $2.10 per 100 lb., f.o.b. mill at Gary, Ind., or South Chicago, Ill., effective May 18. Billet steel angle splice bars for rails heavier than 60 lb. per yard are quoted at $2.55 per 100 lb., f.o.b. mill.

Pullman Co. has air-conditioned 45 Pullman cars in its St. Louis shops since Feb. 1 and 45 more will have been air-conditioned by June 1. About 750 men are employed in the work. The cars will be operated on lines of the Wabash, Missouri-Kansas-Texas, Southern, Chicago & Eastern Illinois, Texas & Pacific and Colorado Southern railroads.

Fabricated Structural Steel

Awards Again Lower—New Projects in Good Volume

STRUCTURAL steel lettings are again predominantly small and total only 6700 tons, compared with 10,200 tons last week. The Ashland Avenue bridge at Chicago, calling for 2300 tons, is the largest booking reported. New projects of 18,125 tons compare with 6000 tons in the previous week and 6850 tons two weeks ago. More than one-half of the total tonnage of new inquiries is accounted for by 8000 tons for a bridge over the Missouri River for the Wabash Railway at St. Charles, Mo., and 3363 tons for the plaza and approach on the Manhattan side of the Thirty-eighth Street tunnel under the Hudson River. Plate awards total 1495 tons. Sheet piling projects, at 12,000 tons, include 9000 tons for the Fort Peck dam in Montana and 1700 tons for a sea wall at Monroe, La. Structural steel awards for the week follow:

NORTH ATLANTIC STATES

Paulsboro, N. J., 510 tons, State highway bridge, to Fort Pitt Bridge Works Co.

Camden, N. J., 210 tons, building for Campbell Soup Co., to Morris Wheeler & Co.

Philadelphia, 218 tons, building for Campbell Soup Co., to Morris Wheeler & Co., Inc.

THE SOUTH

New Orleans, 120 tons, United States Industrial Alcohol Co. building, to Ingalls Iron Works Co.

Gainesville, Ga., 195 tons, highway bridge, to American Bridge Co.

Atlanta, Ga., 255 tons, Chevrolet service plant, to Ingalls Iron Works Co.

State of Texas, 260 tons, highway bridge, to Virginia Bridge & Iron Co.

CENTRAL STATES

Sag, Ill., 400 tons, bridge, to Duffin Iron Works.

Chicago, 2300 tons, Ashland Avenue bridge, to American Bridge Co.

Kansas City, Mo., 110 tons, grain elevator for Kansas City Southern Railroad, to an unnamed bidder.

Pike County, Mo., 145 tons, bridge, to Illinois Steel Bridge Co.

North Platte, Neb., 150 tons, power house, to Omaha Steel Co.

WESTERN STATES

Los Angeles, 850 tons, warehouse for California Walnut Growers Association, to Pacific Coast Steel Corpn.

South San Francisco, 425 tons, subway for Southern Pacific Co., to American Bridge Co.

Bonneville, Ore., 340 tons, ship canal emergency dam, to American Bridge Co.

Bonneville, 500 tons, gates for Bonneville dam, to Pacific Car & Foundry Co.

Odair, Wash., 300 tons, mixing plant, to an unnamed bidder.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Winchester, Mass., 100 tons, theater.

West Hartford, Conn., 250 tons, residence hall for St. Joseph College.

New York, 3363 tons, plaza and approach for Manhattan side of Thirty-eighth Street tunnel under Hudson River; including 2050 tons carbon structural steel, 173 tons of silicon steel, 890 tons of structural steel for tunnel lining as alternate for cast iron segments, and 250 tons of roadway beams. Bids June 6.

New York, 350 tons; post office station O.

Maspeth, Long Island, 750 tons, building for Metal Package Corpn.

Syracuse, N. Y., 190 tons, State livestock building.

Buffalo, 200 tons, factory building for American Radiator & Standard Sanitary Co.

Niagara Falls, N. Y., 100 tons, addition to Carborundum Co.

Downingstown, Pa., 400 tons, paper box factory building; advertisement for general contract bids is expected within the next three weeks.

Columbia County, Pa., 100 tons, Reading Railroad bridge; bids due May 21.

THE SOUTH

Charlotte, N. C., 400 tons, Chevrolet warehouse; bids due May 21.

Charlotte, N. C., 275 tons, warehouse for General Motors Corpn.

Yazoo, Miss., 275 tons, bridge.

CENTRAL STATES

Wellsville, Ohio, 100 tons, building for Sterling China Co.

Pontiac, Mich., 580 tons, shop addition for Fisher Body Corpn.

Pennsylvania Railroad, 365 tons, bridge at Fort Wayne, Ind.

Chicago, 300 tons, sewage treating plant

Chicago, Rock Island & Pacific Railway 250 tons, train shed at Chicago.

Anderson, Ind., 700 tons, plant for Greer Steel Co.

Gurnee, Ill., 200 tons, bridge.

Morgan County, Ill., 110 tons, highway bridge.

St. Charles, Mo., 8000 tons, superstructure for bridge across Missouri River for Wabash Railway; bids June 12.

Chippewa Falls, Wis., 100 tons, Duncan Creek bridge; bids soon.

Columbus and Monroe, Neb., 425 tons, bridges.

WESTERN STATES

Boulder City, Nev., 100 tons, gantry crane, Specification 686-D; bids May 31.

Sacramento, Cal., 295 tons, Montgomery Ward building; opening of bids postponed.

Long Beach, Cal., 200 tons, Benjamin Franklin school; bids open.

Bonneville, Ore., 475 tons, Eagle Creek bridge; bids May 21.

Columbia Falls, Mont., 350 tons, bridge over Flathead River; bids May 17.

FABRICATED PLATE

AWARDS

Tremley Point, N. J., 1375 tons, tanks for Sinclair Refining Co., to Chicago Bridge & Iron Works.

Toledo, Ohio, 120 tons, welded pipe, to American Corrugated Pipe Co.

SHEET PILING

AWARDS

Seattle, 1200 tons, material for Railway Avenue seawall, to Pacific Coast Steel Corpn.

NEW PROJECTS

Zanesville, Ohio, 400 tons, Dover Dam in Muskingum District Conservation project; Bates & Rogers Construction Co., low bidder.

Columbus, Ohio, 790 tons, Main Street bridge; General Asphalt Paving Co., Canton, Ohio, low bidder for general contract.

Monroe, La., 1700 tons, sea wall; S. & W. Construction Co., Memphis, Tenn., low bidder.

Fort Peck, Mont., 9000 tons; bids open May 31.

Ames Case Against NRA Still Pending

WASHINGTON, May 14.—Recent information indicates that the case of W. Ames & Co., Jersey City, N. J., is still pending in the United States Court of Appeals for the District of Columbia. The Supreme Court, on April 29, denied an application for a writ of certiorari to have the Supreme Court pass on the matter before it reached decision in the regular course in the District of Columbia Court. The Supreme Court declined to do this. The case will therefore come on for argument and decision in the regular course in the District of Columbia Court.

The case attacks the validity of Executive Order No. 6646 (NRA certification), the NRA and the steel code, claiming, among other things, that there was unconstitutional delegation of legislative power and violation of the Fourth, Fifth, Ninth and Tenth Amendments to the United States Constitution.

Railroad Equipment

Chicago & Illinois Western has ordered one Diesel-electric switching locomotive from American Locomotive Co.

New York, New Haven & Hartford has asked Goodyear-Zeppelin Corpn., Akron, Ohio, to quote on another streamlined passenger train.

Board of Transportation, New York, has asked for bids returnable May 28 on 500 subway cars.

RAILS AND TRACK SUPPLIES

Delaware, Lackawanna & Western has ordered 850 tons of tie plates from Carnegie Steel Co.

South African Government has ordered 10,000 tons of rails from Dominion Steel & Coal Corpn., Sydney, N. S.

Detroit Scrap Market Is Quiet

DETROIT, May 14.—The local scrap market has been unusually quiet the past week. Dealers believe that steel mills have been holding off taking on further commitments until automotive labor difficulties are settled. Prices are steady and unchanged.

Lead Quotations Marked Up $1 a Ton — Copper Strengthens in London

Sales of Spelter Lighter Following Heavy Demand Early Last Week; Tin Market Dull With Price Movement Narrow

NEW YORK, May 14.—While market interest has been largely centered abroad during the past week, sales have also improved in New York, and bookings for the month through yesterday amounted to 12,400 tons. While this is slightly behind the total for the corresponding April period, daily sales are now averaging better than 1500 tons. Heavy buying abroad has forced the market over the 8c. level, and electrolytic copper was quotable in London this morning at 8.12½c. to 8.15c. a lb., usual Continental base ports. In yesterday's trading a few transactions were made at as high as 8.20c. The strength abroad cannot be reflected in the domestic price of 9c. a lb., delivered Connecticut Valley, largely because of uncertainty over renewal of the code or of the NRA itself. However, the foreign market is not expected to approach the current Blue Eagle price on the present movement.

Tin

The market has been a rather dull affair in the past week, although prices have tended to move upward slightly. Consumers are showing more interest in off grades than in Straits metal and are also concentrating their attention on nearby positions rather than futures. The price today has moved up to 50.75c. a lb., after having been down to 50.25c. a lb. on Wednesday. Tin mills are still operating at a fair rate but recent shipping instructions have not been heavy and mill warehouse stocks have grown very large. This situation is ordinarily corrected in June. At London this morning, standard tin was quoted at £226 for spot and £219 15s. for futures, while Straits was £235. In the East, the market was £228 10s.

Lead

Continued strong demand for lead brought about another price advance of $1 a ton yesterday, and the market is now quotable at 3.65c. a lb., St. Louis, and 3.80c., New York. The leading interest which initiated the advance is still asking $1 a ton premium in the East. Current sales are mostly for June delivery and sellers are refusing to quote on the July position in spite of the occurrence of some inquiry. Recent price increases have not led to any lessening in demand and most sellers are still able to dispose of their outputs in the first hour of trading. The strike in the ore fields has not had much influence, although it will serve to remove about 3000 tons of lead from the market weekly. Ore prices are unchanged.

Zinc

The spelter market is well sustained at the levels of 4.20c., East St. Louis, and 4.57½c. a lb., New York, which were established at the beginning of last week. In fact, in the week's sales of 8100 tons, about 500 tons was reported to have been taken at 4.25c. Sales last week were particularly satisfactory when compared with transactions of 6800 tons in the preceding period. However, business has fallen off since the publication of April statistics last Tuesday and the market is currently quiet. The Prime Western Zinc Producers Committee of the American Zinc Institute, Inc., reports sales during April for delivery that month of 7011 tons of Prime Western at a weighted average selling price of 4.012c. a lb., East St. Louis. Sales of Prime Western for subsequent delivery totaled 12,483 tons at a weighted average selling price of 4.001c. a lb., East St. Louis. The ore market is particularly dull because of the strike, and output this week is not expected to exceed 500 tons. Last week's production was 5350 tons, while shipments totaled about 7100 tons.

The Week's Prices. Cents Per Pound for Early Delivery

	May 8	May 9	May 10	May 11	May 13	May 14
Electrolytic copper, N. Y.*	8.75	8.75	8.75	8.75	8.75	8.75
Lake copper, N. Y.	9.12½	9.12½	9.12½	9.12½	9.12½	9.12½
Straits tin, spot, New York	50.25	50.50	50.62½	....	50.70	50.75
Zinc, East St. Louis	4.20	4.20	4.20	4.20	4.20	4.20
Zinc, New York†	4.57½	4.57½	4.57½	4.57½	4.57½	4.57½
Lead, St. Louis	3.60	3.60	3.60	3.60	3.65	3.65
Lead, New York	3.75	3.75	3.75	3.75	3.80	3.80

*Refinery quotations; price ¼c. higher delivered in Connecticut.
†Includes emergency freight charge.

Aluminum, virgin 99 per cent plus, 19c. to 22c. a lb., delivered.
Aluminum, remelt No. 12 (alloy), carload lots delivered, 14c. a lb., average for week.
Nickel, electrolytic, 35c. to 36c. a lb. based at refinery in lots of 2 tons or more.
Antimony, 14.25c. a lb., New York.
Brass Ingots, 85-5-5-5, 8.25c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	51.75c. to 52.75c.
Tin, bar	53.75c. to 54.75c.
Copper, Lake	10.25c. to 11.00c.
Copper, electrolytic	10.00c. to 10.50c.
Copper, castings	9.75c. to 10.75c.
*Copper sheets, hot-rolled	16.00c.
*High brass sheets	14.25c.
*Seamless brass tubes	16.00c.
*Seamless copper tubes	16.25c.
*Brass rods	12.75c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	4.50c. to 5.50c.
Lead, bar	5.50c. to 6.50c.
Lead, sheets	7.50c.
Antimony, Asiatic	15.50c. to 16.50c.
Alum., virgin, 99 per cent, plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, ½ and ½	30.00c. to 31.00c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	54.87½c.
Tin, bar	56.87½c.
Copper, Lake	10.00c.
Copper, electrolytic	10.00c.
Copper, castings	9.75c.
Zinc, slabs	5.50c. to 5.75c.
Lead, American pig	4.50c. to 4.75c.
Lead, bar	7.75c.
Antimony, Asiatic	16.50c.
Babbitt metal, medium grade	18.50c.
Babbitt metal, high grade	58.87½c.
Solder, ½ and ½	31.75c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy, crucible	5.87½c.	6.62½c.
Copper, hvy. and wire	5.75c.	6.25c.
Copper, light and bottoms	4.75c.	5.25c.
Brass, heavy	3.12½c.	3.75c.
Brass, light	2.37½c.	3.12½c.
Hvy. machine composition	4.62½c.	5.12½c.
No. 1 yel. brass turnings	4.12½c.	4.62½c.
No. 1 red brass or compos. turnings	4.37½c.	4.87½c.
Lead, heavy	2.62½c.	3.00c.
Zinc	2.00c.	2.37½c.
Cast aluminum	10.12½c.	11.25c.
Sheet aluminum	11.50c.	13.00c.

High Test Cast Iron Discussed At Foundrymen's Meeting

(CONTINUED FROM PAGE 46)

which has an evenness of microstructure as indicated by an average Brinell hardness.

Confusion Over Term "Semi-Steel"

There has been much confusion among foundrymen over the use of the term semi-steel, declared Mr. Jennings. "We know that 25 per cent steel added to a cupola charge does not give a casting with a 25 per cent similarity to steel, or 10 per cent, or 5 per cent. We still have cast iron. We may analyze a casting for its chemical content, examine its microstructure, but we have yet been unable to ascertain by any of these methods whether steel had or had not been used in the original mixture."

In a prepared discussion of the paper by Mr. Jennings, Harry Dietert, United States Radiator Corpn., Detroit, stated that the day is at hand when foundrymen will calculate the most advantageous mix of a number of raw materials to form the most cleansing slag for cupola operation. This procedure will give foundrymen a powerful tool to improve melting condition within the cupola, increase the activity of the slag and thus secure a cleaner metal of more uniform texture and a slag which will freeze out of the molten iron at the proper time.

Mr. Dietert called attention to the desirability of producing high test cast iron by the convertor duplexing method. One duplexing process is to mix molten metal obtained from two different cupolas. In one cupola is charged material to make gray iron and in the other steel, thus securing a molten metal with exceedingly low carbon content. Final results are controlled by mixing the proper proportion of molten metal from the two cupolas.

In the near future, information about the carbon-silicon ratio will be secured from charts. The problem will be simplified when a practical method is available to determine the percentage of effective silicon and the non-effective silicon oxide. The laboratory at present reports the silicon as the total of the two, much confusion resulting because the relation between the effective and non-effective silicon varies from day to day.

Molding Sand Discussed

Molding sand is not very refractory, asserted Mr. Dietert. Much of it used in gray iron foundry work begins to fuse at 1400 deg. F., although a few sands will fuse upward to 1800 deg. Expansion and contraction of molding sand may be reduced by removing the fines, reducing the mold hardness, decreasing the moisture content and controlling the clay content. It is a fact that many porosity defects and pin holes in high test castings are formed by excess steam in the mold. One should remember that the more open the sand, the quicker will be the rate the steam is generated within the mold. It is profitable, therefore, to avoid having the permeability of the sand too high in order to reduce the rate of steam elevation. The bond of the sand should be one requiring the smallest amount of water to reach and temper the sand.

Greater attention should be given to placing the gate within a dry sand core, declared Mr. Dietert. A choke in the gate will clean the metal as effectively as a strainer core, which contains a large number of holes. Tests have shown that a minimum strain is secured when the casting is gated through the light section. This holds true only when the rate of pouring is such as to secure progressive setting of the metal from the heavy to the light sections. It places the coldest metal in the heavy section of the casting and preheats that portion of the mold producing the light section. When this method is employed, gates should be thin and wide, spreading the metal as much as possible over the face of the mold, thus avoiding excessive sand burns at the gate end of the casting.

Consistent improvement in properties of cast iron are not obtained by superheating alone, according to experiments made in varying only the furnace temperature, stated Professor Frederick G. Sefing and M. F. Surls, Michigan State College, in a paper on "Superheating Cast Iron." If the time of the iron in the furnace at a high temperature is increased, more favorable results are obtained. High superheat has a tendency to give a structure consisting of fine graphite and ferrite, this tendency being more pronounced as the size of the section decreases.

W. H. Spencer, Sealed Power Corpn., Muskegon, Mich., reviewed the fundamental aspects of gray cast iron, and Dr. E. J. Martin, General Motors Research Laboratories, Detroit, discussed "Spectroscopy" at one session. H. Bornstein, Deere & Co., Moline, Ill., talked on the heat treatment of cast iron and J. W. Bolton, Lunkenheimer Co., Cincinnati, on its engineering properties. E. K. Smith, Electro Metallurgical Co., Chicago, spoke on "Alloy Cast Irons" and F. J. Walls, International Nickel Co., New York, on "The Foundry of 1950."

OBITUARY

(CONTINUED FROM PAGE 45)

ploy of the Inland Steel Co. as secretary of the company in charge of the credit department and was also active in a sales capacity. In 1918 he was elected a director of the company and in 1921 became vice-president, also retaining the office of secretary. On Jan. 31, 1922, he was elected first vice-president and general manager of sales, which position he had held since that time. He was a member of the commercial committee of the American Iron and Steel Institute. Of recognized ability, he also was widely known for his genuine friendliness and unfailing courtesy.

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A. L. LINDERMAN, secretary-treasurer, Neely Nut & Bolt Co., Pittsburgh, died suddenly at his Pittsburgh home on May 8, aged 46 years. He attended Carnegie Institute of Technology in the class of 1909, and had been associated with the Neely company for about 14 years.

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GEORGE F. SHELDON, office manager, Russell, Burdsall & Ward Bolt & Nut Co., Coraopolis, Pa., died suddenly on May 6. He was 48 years old. He had been associated with the company for 27 years, having served in an executive capacity at the Rock Falls plant prior to becoming established at Coraopolis.

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ALFRED E. HAMMER, president and manager of the Malleable Iron Fittings Co., Branford, Conn., died on May 9 of a heart ailment. He was born in Boston 77 years ago, and went to Branford as a boy. He was made president of the company in February, 1921, and was a former State Representative and Senator in 1889 and 1907 respectively.

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HERMAN A. POPPENHUSEN, one of the founders of the Green Engineering Co., died May 8, aged 60 years. He retired in 1923 when the Green company, manufacturer of power plant equipment, was sold to the International Combustion Engineering Co. At the time of his retirement he was vice-president and general manager of his company. He was a native of Flushing, Long Island, and had been graduated from Massachusetts Institute of Technology.

Pipe Lines

Arkansas-Louisiana Gas Co., Ardis Building, Shreveport, La., has authorized new welded steel pipe line from Sligo to Princeton, La., about nine miles, for natural gas.

Buckley, Wash., plans purchase of 6-in. steel pipe for replacements in main water line. Charles Harkins, town clerk, is in charge.

Nebraska Public Service Co., Ponca, Neb., plans installation of steel pipe line for natural gas system. George Smith, district manager, Ponca, is in charge.

Phillips Petroleum Co., Bartlesville Okla., plans about 14,000 ft. of 8-in. welded steel pipe in N. E. Twenty-fourth Street, Oklahoma City, for crude oil. A. H. Riney, first-noted address, is engineer in charge.

United States Engineer Office, Galveston, Tex., asks bids until May 20 for 50 lengths of 20-in. steel pontoon pipe, and one 90-deg. steel pontoon pipe elbow (Circular 231).

United Gas Public Service Co., City Bank Building, Shreveport, La., plans 12-in. welded steel pipe line from Rodessa, La., to point near Belcher, La., where connection will be made with main trunk line of company, about 17 miles, for natural gas service at first-noted place. Cost over $125,000. Company has arranged fund of about $200,000 for this and other pipe line construction.

Activities Bearing on Machine Tools Distribution

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A Department Conducted by L. M. Waite

° ° °

CROCKER-WHEELER "AT HOME"

THE Crocker-Wheeler Electric Mfg. Co. inaugurated an at-home event May 10-11 at the Ampere, N. J., plant of the company. In connection with the purpose, Secy. E. C. Jones announced the intent to give friends a periodical opportunity to become familiar with the comprehensive line of standard motors and equipment manufactured by the company in both a.c. and d.c. types. Also to demonstrate applications of the company products to various types of standard shop machines and special equipment employing built-in motors. Special equipment shown included flotation machines for ore separation recently built for a foreign customer. The company's resilient flexible coupling was on display.

President Edmund Lang and those associated with him, including A. L. Doremus, vice-president, connected with the company for 43 years; E. C. Jones, secretary; Kenneth St. John, long at the head of the purchasing department; F. A. Elshoff, works manager; J. L. Auer, superintendent, and other operating heads, took active charge of guests. Members of the sales organization officiated as guides in taking a long list of visitors through the plant and to points where standard units and outstanding developments were on display and under operation.

The company sales effort is handled largely on a basis of direct contact with users and the number of acceptances of the invitations which were sent out was very gratifying to officials.

FOREIGN

FOREIGN machine tool specifications reviewed during the past week indicate a similarity of buying conditions within Great Britain and the United States. In the smaller machine brackets, largely new tools are specified and little mention is made of used tools. In large equipment, including presses, shears, planers, radials and shapers, used machines are called for. One inquiry for large equipment states that in the event prices are sufficiently low the prospective purchaser will send engineers to the United States to inspect the machines offered. It is reported that this inquiry has been received in several machine-tool-building countries. As a check on the large-machine market condition, several manufacturers in this country report many repair parts inquiries covering machines built 20 to 25 years ago. There is evidently some international hesitancy in using available funds for the purchase of new heavy equipment. When such restrictions, whatever their cause, are removed, delivery will be a determining factor in the placing of orders for this class of equipment; this because large machines are neither heavily stocked nor quickly built.

* * *

SALES AREAS

New York-Metropolitan. — Five out of seven dealers report April as the best month of the year. Four out of seven report May as slow in orders up to the 15th, with new inquiries holding well.

Boston.—Dealers report the order situation as relatively satisfactory with inquiries holding up in volume. Two dealers report April as the best in a number of months and as boosting the 1935 monthly average. The United Shoe Machinery Co., Beverly plant, has placed a number of orders for machines included in the equipment list which it has had under consideration for some time. Orders so far placed are said to be for standard machines.

Hartford, Conn.—Actual area orders are light. Much work is being done on a number of pending inquiries. New inquiries are said to be in the making and a revival of two 1934 lists is reported. One dealer operating in the New Haven-Hartford area reports April as the best month of the year.

Buffalo.—Because of the fact that plate mills in this district are going into the production of sheets, there is decided activity in the preparation of equipment lists and quotations. It is reported that the

possibility of delayed shipments on certain types of machines is a factor in the desire to get orders placed.

Cincinnati.—The strike situation at Toledo has proved to be an effective means in the moving of a considerable number of both new and used equipment from factories and warehouses in the Cincinnati area. It is reported that a number of General Motors engineers and departmental heads were on the ground and were authorized to make selections of equipment for immediate shipment.

Chicago.—A number of lists are being cleaned up through the placing of orders. Inquiries continue reasonably active. Several makers report expectancy of a good area business for some little time to come.

Pittsburgh.—From a leading practical authority on machine tool distribution, we learn: "Orders very quiet during the past two weeks. Inquiry is continuing fair. Sentiment is fairly cheerful. Diversified opinion exists as to what may be expected from the steel industry in the way of orders during the balance of the quarter. We are hopeful that delayed April orders will come through during the latter part of May. If sane reasoning can be instilled into labor unrest, we will continue to ride on a keel as good or better than the first quarter. Now is the time for business to grab the old boot straps —radical legislation or no legislation."

Southern.—A prominent Southern dealer reports that industries such as rail mills, cast iron pipe, blast furnaces and cement plants are not yet able to translate new machine tool inclination into orders. Some second-hand tools, relatively few, are moving, but the area is handicapped because it must depend so largely upon heavy industries; dealers, however, are optimistic.

Houston, Tex., is reported as picking up a number of used tools from Metropolitan area second-hand equipment dealers.

New England-Detroit.—A New England manufacturer of turret machines is reported to have accepted a very sizable order covering a range of machines to be shipped into the Detroit automobile area. The Toledo strike is given as the order factor.

A Mid-Western manufacturer of standard shop machines reports area conditions as follows: Plant reasonably busy. A large part of orders are from Chicago area. Export orders are in good volume. Metropolitan area orders only a little better than fair. Pacific Coast business poor. Volume of inquiries high.

Personals.—W. S. Chase, retired from industrial activity, is at home at 106 South Cordova Street, Alhambra, Calif. Mr. Chase is well known among builders and users of machine tools through long association with the screw machine industry as treasurer of the Cleveland Automatic Machine Co., and later as sales manager of National-Acme Co. in the development of distribution policies covering the original multiple spindle screw machines and screw machine products.

Donner-Goetz, Inc., 502 M. & T. Building, Buffalo, has been organized to act as special sales representative in the iron and steel field. Company will also represent Pratt & Letchworth Co., Buffalo, manufacturer of steel, Meehanite iron, and malleable iron castings, and General Drop Forge Co., Buffalo. Robert Donner, president of the newly formed company, was associated for many years with the Donner Steel Co., prior to its absorption by Republic Steel Corpn.

Pittsburgh Piping & Equipment Co., Pittsburgh, has removed New York office from 220 Broadway to Woolworth Building, 233 Broadway.

Enameling and De-enameling Feature Finishing of Washing Machine Tubs

(CONTINUED FROM PAGE 29)

The tank is 78 in. long, 36 in. wide and 48 in. deep in its inside dimensions and is constructed of 1⅛-in. cast steel. Drain openings are provided in the furnace floor beneath the tank to carry away the caustic in case the de-enameling tank fails. These openings are connected to an emergency steel tank in a pit under the furnace. The tank has an insulated cover handled by an overhead electric hoist, which is placed over the tank when the unit is not operating in order to reduce heat losses.

The furnace is a three-phase, 60-cycle unit rated at 125 kw., 220 volt capacity. The control panel is equipped with a two-point recorder controller. The temperature of the bath is controlled by a thermocouple placed in a heating chamber outside of the tank and another inclosed in a steel tube located in the bath. The pieces to be de-enameled are immersed in the bath for a minimum period of 7 min., the time depending on the part, gage of steel and the number of enamel coatings. However, the immersion time required is listed by the manufacturer at from 2 to 8 min. and test pieces have been de-enameled in less than 2 min.

The work is placed in a basket, three washing machine tubs or one sink at a time. The overhead hoist handles the basket in and out of the de-enameling bath and serves adjoining tanks arranged in a row that are used for subsequent pickling operations.

The tank is operated 8 hr. a day and can be operated 10 hr., the remainder of the 24-hr. period being required for rejuvenation. De-enameling in a day's operation is limited to the removal of an amount of enamel that is not in excess of 10 per cent of the weight of the caustic in the weight. The weight of the caustic solution is approximately 112 lb. per cu. ft.

As there is a depletion of the alkaline solution during operations, sodium-hydroxide, which is in the form of flakes of pure hydroxide, is added to the bath in the morning to bring the liquidized hydroxide up to the proper level, or 8 to 9 in. from the top of the tank. A black sludge is formed by the reaction of the bath with the enamel and this is allowed to settle during the night and is removed in the morning.

Much of the sludge, which becomes caked, settles in a basket that is set in the bottom of the tank, and the basket is lifted out by the hoist. Sludge that is not removed in the basket is scraped out of the bottom of the tank with a scoop. The temperature of the bath is reduced during the removal of the sludge.

On removal from the alkaline bath the work is dipped into a tank of boiling water heated by an open-end steam coil. The purpose of this washing is to remove the caustic adhering to the metal and sludge that is deposited on the metal. Then the tubs are dipped into a tank containing a 10 per cent hydrochloric acid solution. A clean water rinse follows, after which the pieces are dipped into another neutralizing tank in which is placed 15 lb. of soda, providing a 0.3 to 0.4 sodium oxide solution.

Tubs, after de-enameling and pickling, have dark discolorations on the surface designated as scum, which are believed to be caused by carbon. To remove this discoloration the tubs are sandblasted and the surface of the metal is restored to the uniform brightness that it possessed before enameling.

The de-enameled work then goes to the pickling room of the enameling plant where it is pickled, the pickling methods being the same as are followed in pickling before enameling work that comes directly from the press shop. The de-enameling equipment has a capacity for removing the enamel from 1800 sq. ft. of surface or from 100 tubs in an 8-hr. day. All the work is done by three men, one for the enameling tank, one for the pickling tank and the third for the sandblast equipment.

Boat Spikes Put On Nail Base

BOAT spikes will no longer be sold as spikes but will be marketed as boat nails on the wire nail base of $2.60 per keg, Pittsburgh, for carloads, and $2.80, for less than carloads. This move places boat nails under the steel code and has the effect of reducing quoted prices 10c. to 20c. per 100 lb.

Rural Industrial Location Cushion of Depression

(CONTINUED FROM PAGE 33)

chanics of one type or another, many of them have various abilities which they can turn to good account. That is some of them are good painters, paper hangers, radio fans, carpenters, and the like, and many of them get odd jobs among their neighbors which they can do in spare time, adding a little to their incomes and keeping busy at things that they like to do.

From these few examples it will be seen that in order to realize many of the most important advantages of decentralization the management must take a very important part in seeing to it that the workers are educated to them. This, of course, has been especially true since the depression when the question of keeping people on some decent basis of living became acute. It might be said that what we have actually done is to attack the question of making good use of leisure, which is another of the problems which are being so widely discussed in these changed and changing times. We feel that it has been solved, at least in part, here.

Industrial management must be versatile and the problems which it should deal with go far beyond the ordinary ones of purchasing, production, sales and finance. In a case like ours it must develop a technique for making the most of its location. We hear much about subsistence farming, the profitable employment of leisure and decentralization, and we have a practical combination of these three which we feel has been of great benefit to all concerned.

Weekly Steel Wages Well Above 1934

THE average weekly earnings of wage-earners in the steel industry in the first quarter of 1935 were 22 per cent higher than they were during the first three months of 1934, according to the American Iron and Steel Institute.

Steel employees paid on an hourly, piecework or tonnage basis received an average of $22.54 a week, compared with $18.46 a week in the corresponding period of 1934. Average hours worked per week in the industry during the first quarter of 1935 were 34.3, compared with 31.5 in the year before.

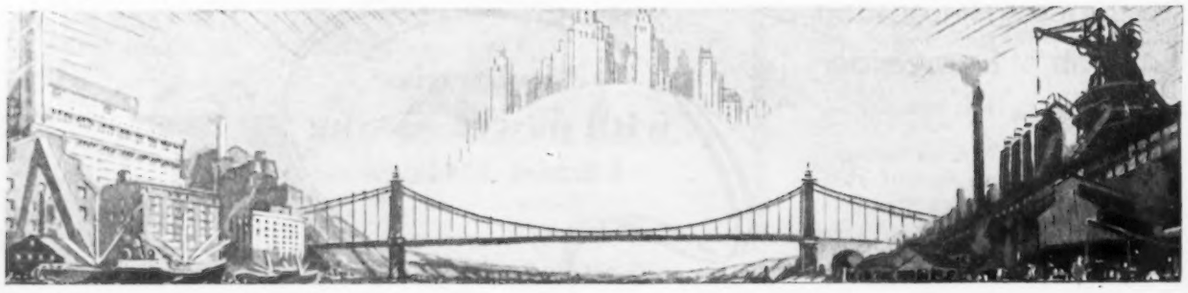
From January to December last year, average hourly earnings of steel employees paid on an hourly, piecework or tonnage basis increased by 11.5 per cent. The greater increase in size of weekly pay envelopes resulted from the greater number of hours worked. The 11.5 per cent increase in average hourly earnings of wage-earners in the steel industry last year compares with an increase of only 7.5 per cent in the average wage per hour in 25 major industries, as reported by the National Industrial Conference Board.

During the whole of 1934, wage-earning employees of the steel industry earned an average of 6.4 per cent more per hour than they did in 1933.

Steel-making requires men with such a high degree of skill and specialized training that almost 93½ per cent of the total number of employees in the steel industry are classified on the payrolls above the class of common labor, most of them as skilled or semi-skilled workers. Only 6.66 per cent of steel employees are being paid the minimum wage rates, reports from companies representing 84 per cent of the ingot capacity of the country have indicated.

Moreover, the actual wage rates now being paid by the industry are from 10 to 20 per cent higher than the minimum rates specified in the steel code. Reports covering February, 1935, were received from companies which employed 293,346 persons during that month. Of this number, only 19,548 were being paid the minimum wage rate. Several companies had less than 3 per cent of their employees in the common labor classification.

Present demand for certain classes of skilled labor in the steel industry is reported to be nearly equal to the available supply, even though current operations are below 45 per cent of capacity. Instances have been recently cited where exhaustive search and widespread advertising have failed to find men experienced in particular types of work.



Plant Expansion and Equipment Buying

Automotive Machine Tool Buying Expected to Start About June 1

WITH the machine tool trade rather quiet, interest in the industry is centered on automotive purchases which are expected to begin in significant volume soon after June 1. Outstanding inquiries are said to bulk very large, and buying may reach larger proportions than usual because of the fact that automobile makers plan to expand their capacity somewhat for the first time since 1930. However, as usual, the majority of tools to be purchased will likely be of a cost saving character.

Additional railroad purchases are expected as a result of the Supreme Court decision declaring the railroad pension act unconstitutional. Such business, however, will likely come in the last half of the year. Air conditioning equipment makers have recently been more active buyers of tools. No other major industrial group is now an outstanding tool purchaser.

NORTH ATLANTIC

Mathieson Alkali Works, Inc., 60 East Forty-second Street, New York, has leased about 300 acres of dolomite properties in Burnet County, Tex., and plans installation of new mining plant, with elevating, conveying, loading and other mechanical-handling equipment.

Signal Supply Officer, Army Base, Brooklyn, asks bids until June 3 for 10-kva. gasoline engine-driven power units, in lots of three, four or five (Circular 126).

Edward F. Caldwell & Co., 38 West Fifteenth Street, New York, manufacturer of electric lighting fixtures and equipment, has leased buildings at 30-34 West Fifteenth Street for expansion.

Continental Can Co., 1 Pershing Square, New York, and 5601 San Leandro Street, Oakland, Cal., has let general contract to Austin Co. of California, Oakland, for one-story addition to plant at Oakland, primarily for storage and distribution. Cost about $50,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 24 for 10 steel valves for Brooklyn and Charleston navy yards (Schedule 4058); until May 31, for 21 30-gal. steam-jacketed aluminum kettles for Brooklyn, Philadelphia and Charleston yards (Schedule 5087).

McKesson & Robbins, Inc., Spirits Division, 40 East Thirtieth Street, New York, has leased 40,000 sq. ft. in Port Authority Commerce Building for wine and liquor storage and distributing plant.

Arguls Gas Stations, Inc., affiliated with Arguls Gas & Oil Sales Co., Inc., 136 Flatbush Avenue Extension, Brooklyn, will soon let contracts for new bulk oil storage and distributing plant on site 100 x 320 ft., on Greenpoint Avenue, Long Island City. Cost over $40,000 with steel tanks and other equipment.

Animator Corpn., Albany, N. Y., has been organized by Harry O. Weinberg, 152 Third Street, Troy, N. Y., and associates, capital $60,000, to manufacture electrical equipment and devices for advertising service.

Mifflinburg Body Co., 1776 Broadway, New York, manufacturer of motor truck bodies, with main plant at Mifflinburg, Pa., has leased space in building at 549 West Thirty-ninth Street for new factory branch, storage and distributing plant. Present branches at 2562 Atlantic Avenue, Brooklyn, and Newark, N. J., will be consolidated at new location.

Superintendent of Lighthouses, St. George, Staten Island, New York, asks bids until May 20 for 16 clock-governed, motor-driven signal timers for control service for lights, fog signals, etc. (Proposal 48591).

Board of Education, Chester, N. Y., plans manual training department in new two-story and basement school, for which special election will soon be held to approve bonds for $165,000. R. R. Graham, 25 Prospect Street, Middletown, N. Y., is architect.

Federal Machine Products Corpn., Montclair, N. J., has been organized by Harry W. Lauterstein, 19 Waterbury Road, Upper Montclair, and associates, to manufacture metal castings, metal products, etc.

Standard Spark Plug Co., Bouvier Street and Cheltenham Avenue, Philadelphia, has leased one-story factory at 5417 Wayne Avenue for new plant.

Bridesburg Foundry Co., Tacony and Duncan Streets, Philadelphia, manufacturer of brass, bronze and other metal castings, has taken title to one-story shop, 40 x 105 ft., at 4606 Salmon Street, for extensions.

Supply Officer, Navy Aircraft Factory, Navy Yard, Philadelphia, asks bids until May 21 for one motor-driven riveting hammer (Req. 5233-35), one portable weighing scale (Req. 5227-35), one connecting rod and piston clarifying scale (Req. 5214-35), one motor-driven tool-sharpening machine (Req. 5208-35).

Department of Public Works, Bureau of Highways, City Hall Annex, Philadelphia, Frank H. Caven, director, asks bids until May 20 for metal traffic directional signs, route markers and posts, and structural steel smoke plates.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 21 for one motor-driven jig borer (Schedule 5090); until May 31, one motor-driven automatic screw machine (Schedule 5080), 42 single leg manometers (Schedule 5091), for Philadelphia Navy Yard.

NEW ENGLAND

Florence Stove Co., Gardner, Mass., manufacturer of oil and gas stoves, parts, etc., has awarded general contract to Columbus Co., 39 Sunset Road, for two plant additions, three-stories and basement, 50 x 90 ft., and one-story, 70 x 100 ft. respectively. Cost about $75,000 with equipment. Frank D. Chase, Inc., 307 North Michigan Avenue, Chicago, is architect and engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 21 for one motor-driven portable air compressor (Schedule 5084) for Boston Navy Yard; 100 engine-driven vacuum pumps (Schedule 5034), for Hartford, Conn., and Philadelphia yards; until May 28, 52 fuel oil burners and spare parts (Schedule 5015), for Newport, R. I., Philadelphia and Mare Island yards.

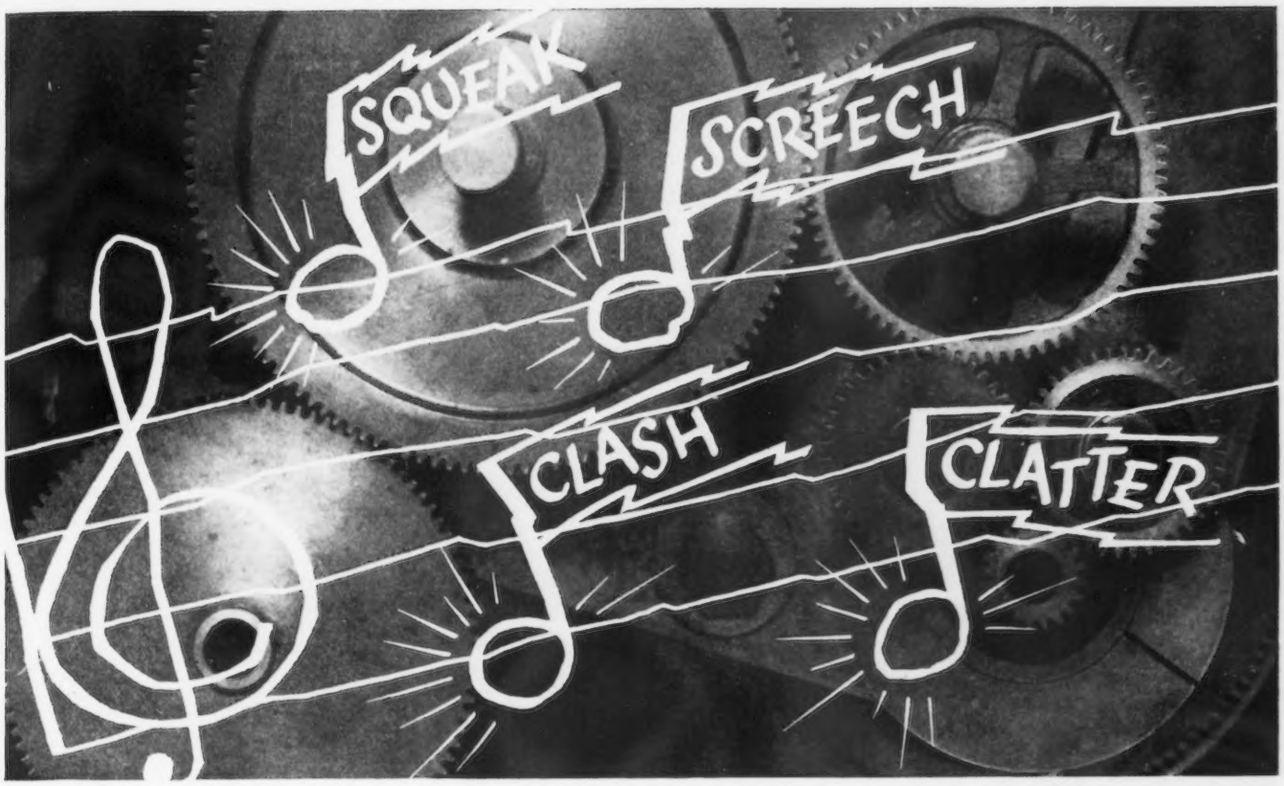
Meyer Iron & Brass Foundry, Inc., Shelton, Conn., has been organized by Frederick S. Meyer, Howe Avenue, and associates, to manufacture iron, bronze, brass and other metal castings.

Superintendent of Waterworks, P. S. Nugent, City Hall, Lawrence, Mass., asks bids until May 20 for new 6,000,000 gal. per day horizontal centrifugal pumping unit; motor equipment for pump drive; two motor driven exciter sets; four-panel switchboard, gage board and auxiliary equipment for municipal pumping plant. John T. Kilcourse is director of engineering.

School Board, Stoneham, Mass., Charles E. Varney, superintendent, plans manual

STILL THAT

nerve-shattering discord



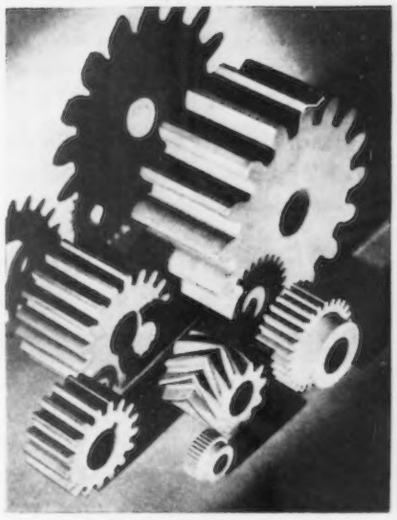
SCREECHING, clashing gears slow down production, put workmen's nerves on edge and loudly proclaim inefficient, wasteful operation. Quiet gear drives mean longer machine life, higher production schedules and more alert workmen.

On the heaviest types of rolling mills and presses as well as machines where speeds are high and loads light, the use of Bakelite Laminated driving gears and pinions are effectively silencing gear train operation. These gears are also unaffected by moisture, fumes, acids and alkalies, and cannot corrode under any conditions. Their use lengthens the efficient life of the metal gears with which they engage.

To learn about the various types of Bakelite Laminated Gears write to us for illustrated booklet 2L, "Bakelite Laminated."

★

Bakelite Laminated gears and blanks are manufactured under the following tradenames: FORMICA *(Formica Insulation Co., Cincinnati, O.),* LAMICOID *(Mica Insulator Co., Schenectady, N.Y.),* MICARTA *(Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.),* PANELYTE *(Panelyte Corp., Trenton, N.J.),* PHENOLITE *(National Vulcanized Fibre Co., Wilmington, Del.),* SYNTHANE *(Synthane Corp., Oaks, Pa.)*



BAKELITE CORPORATION, 247 Park Avenue, New York, N. Y. ..... 43 East Ohio Street, Chicago, Ill.
BAKELITE CORPORATION OF CANADA, LIMITED, 163 Dufferin Street, Toronto, Ontario, Canada

BAKELITE

REGISTERED U. S. PAT. OFF.

"The registered trade marks shown above distinguish materials manufactured by Bakelite Corporation. Under the capital "B" in the numeral sign for infinity, an unlimited quantity, it symbolizes the infinite number of present and future uses of Bakelite Corporation's products"

LAMINATED GEARS • PINIONS • PULLEYS • CASTERS

training department in new multi-story senior high school. Cost about $300,000. Adden, Parker, Clinch & Crimp, 177 State Street, Boston, are architects.

Tidewater Oil Co., 17 Battery Place, New York, has let general contract to Argentieri Construction Co., 37 Weybosset Street, Providence, R. I., for new bulk oil storage and distributing plant at Worcester, Mass. Cost about $45,000 with steel tanks and other equipment.

OHIO AND INDIANA

National Supply Co., 3320 Bishop Street, Toledo, Ohio, manufacturer of gas and oil well equipment and supplies, has plans for one-story addition, 120 x 300 ft. Cost over $100,000 with equipment. Mills, Rhines, Bellman & Nordhoff, Inc., Ohio Bank Building, is architect and engineer.

Board of Public Works, Dover, Ohio, has secured fund of $330,000 through Federal aid for extensions and improvements in municipal electric light and power plant, including new steam turbine unit, high-pressure boilers, stokers, condensers, switchgear and auxiliary equipment; also, appropriation of $59,200 for expansion and betterments in municipal water station, including electrification of pumping plant and installation of new equipment. Waldo Harline is city engineer.

Bearing Bronze Casting Co., Cleveland, has been organized by M. G. Leypoldt, R. E. Meyers, 14010 Woodworth Road, and associates, to manufacture bronze and allied metal castings.

United States Engineer Office, Cincinnati, asks bids until May 21 for one steel coffer, one steel navigation gate and one steel bulkhead, completely assembled (Circular 72).

Saw & Knife Specialty Co., 1375 East Thirty-third Street, Cleveland, has leased two-story building at 6526 Carnegie Avenue, S. E., about 10,000 sq. ft. floor space, and will remodel for new plant.

Department of Public Service, East Liverpool, Ohio, E. B. Laughlin, service-safety director, plans extensions and improvements in municipal water filtration plant, including new boilers, stokers, filters and other equipment. Cost about $40,000.

Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until May 20 for 50 automatic valve assemblies, flotation gears (Circular 721), 350 wind cones, 24-in. diameter (Circular 726); until May 27, five bombing trainer assemblies, five bombing trainer target assemblies (Circular 725); until May 31, 10 bank and turn indicators (Circular 729).

Williams Brothers, Inc., 1125 West Beardsley Avenue, Elkhart, Ind., has been organized by Sidney W. and Ursa S. Williams, 816 Edwardsburg Avenue, to manufacture brass, bronze and other metal castings.

Eli Lilly & Co., 740 South Alabama Street, Indianapolis, manufacturers of drug and chemical products, have let general contract to Leslie Colvin, Continental Bank Building, for two-story top addition to plant, 71 x 180 ft., for storage and distribution. Cost about $90,000 with equipment. Robert F. Daggett, Continental Bank Building, is architect.

BUFFALO DISTRICT

Carborundum Co., Niagara Falls, N. Y., manufacturer of grinding wheels and other abrasive materials, etc., has plans for six-story addition, 75 x 80 ft. Cost over $85,000 with equipment.

Construction Service, Veterans' Administration, Washington, is planning extensions and improvements in Veterans' Hospital at Bath, N. Y., including new one-story machine shop, and automobile service and repair building, for which a fund of $50,000 is being arranged. New equipment and utility building is planned at institution at Canandaigua, N. Y., to cost about $30,000 with equipment.

Selecto Sales Machines Co., Inc., Utica, N. Y., has been organized by Harry S. Benjamin, 1005 Parkway East, Utica, and Joseph V. Faith, Bowen Products Corpn., Auburn, N. Y., manufacturer of metal specialties, to manufacture weighing machines, parts and kindred calculating machinery, operating with capital of $470,000.

WASHINGTON DIST.

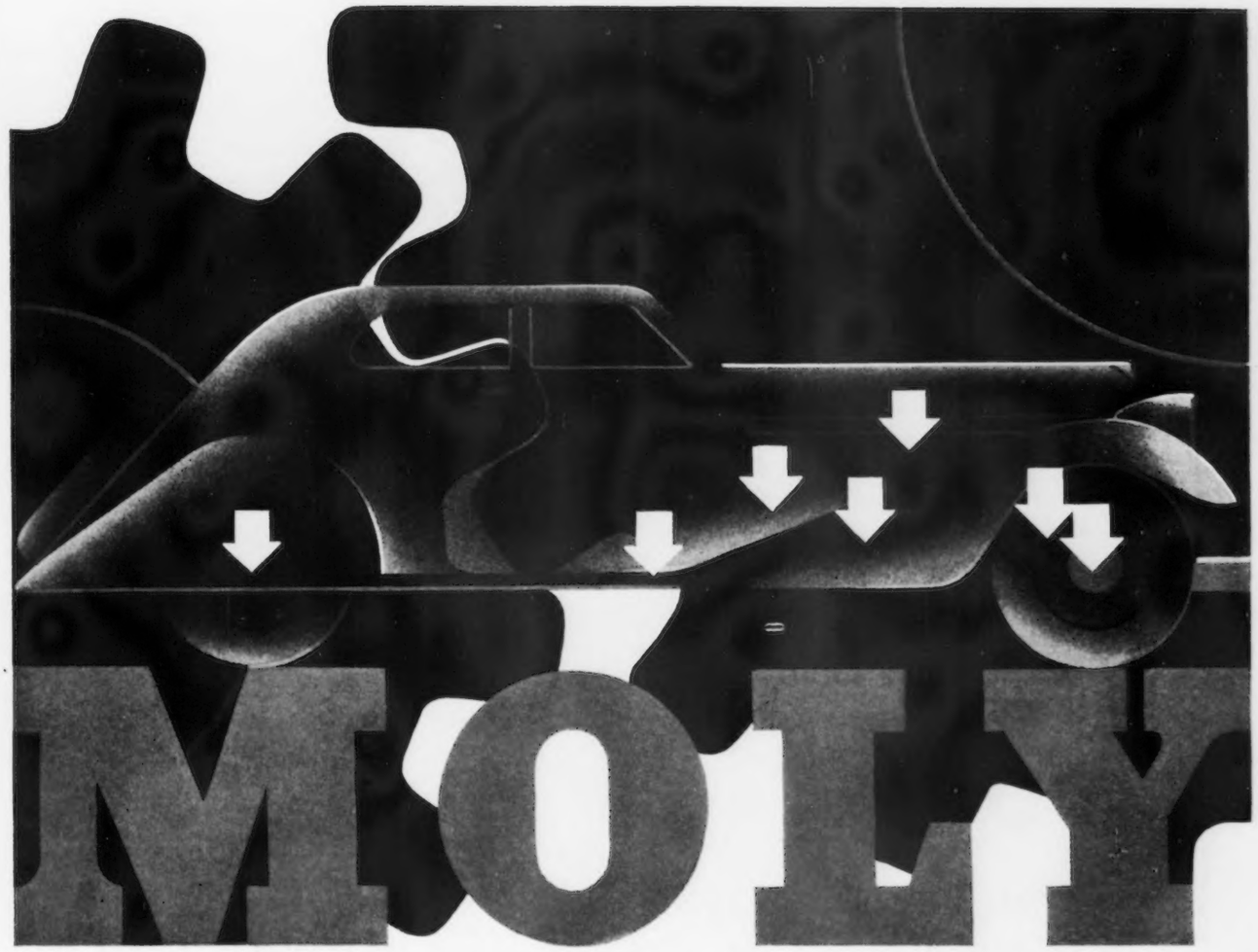
Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until June 3 for bolts, rivets, pins, copper tubing, steel spring wire, fan belts, cable and other supplies and parts for automotive service (Circular 134).

Calvert-Maryland Distilling Co., Inc., Relay, Baltimore, a subsidiary of Joseph E. Seagram & Sons, Inc., New York, has superstructure under way on six-story addition, 158 x 160 ft., for storage and distribution, for which general contract recently was let to Engineering & Contracting Corpn., 504½ St. Paul Street. Cost over $100,000 with equipment.

Board of District Commissioners, District Building, Washington, asks bids until May 22 for lead-covered insulated telephone cable for electrical department; until June 4, pumping machinery and auxiliary equipment for unit No. 3, new sewage treatment plant, Blue Plains. Cost of last noted installation about $130,000.

John H. Heald Co., Lynchburg, Va., manufacturer of paperboard, laminated board and allied products, affiliated with Mead Corpn., Chillicothe, Ohio, has let contract to Virginia Bridge & Iron Co., Roanoke, Va., for one-story addition. Cost over $70,000 with equipment.

United States Engineer Office, Fort Belvoir, Va., asks bids until May 27 for one hand planer and jointer (Circular 71).



puts vitality into carburizing steels

REAR-END and transmission gears, pinions, cam and crankshafts, spindles, wrist and steering-knuckle pins . . . more is demanded of them than ever before in the history of the automotive industry. Many of the steels on the market are suitable for the carburizing required for such parts facing the stress of high speed, shocks and the fatigue of long periods of continuous heat and action.

But today there must also be considered the important matter of *facility* in the construction of such parts.

SAE 4615 (Nickel Molybdenum) is widely proving itself the most economical and otherwise most desirable steel for carburized gears of all types and other parts requiring the same properties. Good machinability—tough and refined case and core when quenched from the carburizing pot—and small and measurable distortion during heat treating . . . are some of the properties which have led to almost national standardization on this steel for automotive carburized parts.

There is also, of course, the 3.5% Nickel Molybdenum steel for similar, but heavier-duty applications.

Follow the rapid strides being made by "Moly" in most every diversification of the steel and iron industry — by asking to be put on the mailing list of our periodical house organ, "*The Moly Matrix.*" Write also for these interesting books: "*Molybdenum in* 1934" and "*Molybdenum in Cast Iron* — 1934 *Supplement.*" And, if you've an alloy problem that's difficult to solve, be free to enlist the help of our metallurgists and Detroit experimental laboratory. Climax Molybdenum Company, 500 Fifth Ave., New York City. (In Canada: Railway & Power Engineering Corp., Ltd.)

CLIMAX Mo-lyb-den-um

United States Coast Guard, Washington, asks bids until May 20 for bronze propellers for motor boats, as required during period from July 1-Dec. 31, 1935.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 21 for 46 steel cylinders and 46 steel plungers, both chrome-molybdenum, for Norfolk, Va., Navy Yard (Schedule 5001).

SOUTH CENTRAL

United States Pipe & Foundry Co., Twenty-seventh Street, Chattanooga, Tenn., plans extensions and improvements in local plant, including three-story pattern shop, one-story machine shop, one-story pipe fittings shop and other units. Part of present plant, with No. 1 shop, will be remodeled and improved, including additional equipment. Entire project will cost over $200,000 with machinery. Headquarters are at Burlington, N. J. J. T. Giles is local manager at Chattanooga.

Coffey Distilling Co., Fisherville, Ky., has plans for new distillery, including main units, fermenting building, power house, storage and distributing building. Cost over $80,000 with equipment. Walter C. Wagner, Breslin Building, Louisville, is architect.

Town Council, Logansport, La., asks bids until May 28 for motor-driven deep-well pumping machinery and accessories with capacity of 150 gal. per min.; 50,000-gal. elevated steel tank on 100-ft. tower, pipe lines, etc., for municipal waterworks. Charles D. Evans, Slattery Building, Shreveport, La., is consulting engineer.

Bancroft Bag Co., Monroe, La., manufacturer of paper bags and containers, has plans for addition to paper converting plant at West Monroe, one-story, 80 x 200 ft. Cost over $75,000 with equipment. Herbert Dickard, Monroe, is engineer.

Bernheim Distilling Co., 1701 West Breckinridge Street, Louisville, has let general contract to International Steel Co., Evansville, Ind., for multi-story addition for storage and distribution. Cost over $100,000 with equipment. Leslie V. Abbott, 8 Kenwood Village, Louisville, is architect.

SOUTH ATLANTIC

Swift & Co., Union Stock Yards, Chicago, have asked bids on general contract for new two-story and basement branch plant at Augusta, Ga. Cost about $85,000 with equipment.

City Council, DeLand, Fla., plans new municipal electric light and power plant and electrical distribution lines; also municipal incinerator plant and extensions and improvements in city waterworks, including pumping machinery and accessory equipment. Fund of $525,000 has been secured through Federal aid for entire project.

Colonial Oil Co., Savannah Bank & Trust Co. Building, Savannah, Ga., plans new bunker dock on waterfront for bulk oil storage and distribution. Cost over $45,000 with steel tanks and other equipment.

Lee County Packing Co., Fort Myers, Fla., has authorized plans for rebuilding fruit canning and packing plant, recently destroyed by fire. Cost over $50,000 with equipment.

Becker Baking Co., Gaffney, S. C., has plans for new one-story and basement baking plant, 70 x 130 ft., on site recently acquired. Cost about $40,000 with ovens and other equipment. W. E. Long Co., 155 North Clark Street, Chicago, is engineer.

WESTERN PA. DIST.

United States Engineer Office, Pittsburgh, asks bids until May 22 for bars, screens, grilled doors, trash rack frames, etc., for Tygart River reservoir dam, W. Va. (Circular 359).

Schenley Distillers Corpn., Schenley, Pa., plans extensions and improvements in plant of subsidiary, Old Quaker Distillery, Lawrenceburg, Ind., including additional equipment. Cost over $75,000 with equipment. Carl J. Kiefer, Schmidt Building, Cincinnati, is consulting engineer. Main offices of company are at New York.

Old Tavern Brewing Co., Fairmont, W. Va., recently organized, has acquired plant of Monongahela Valley Brewing Co., Washington Street. Plans are under way for extensions and improvements, including additional equipment. Cost close to $30,000 with machinery.

Hurley Machine Co., 926 Penn Avenue, Pittsburgh, has leased about 7000 sq. ft. floor space in building at 921-25 Liberty Avenue for new plant.

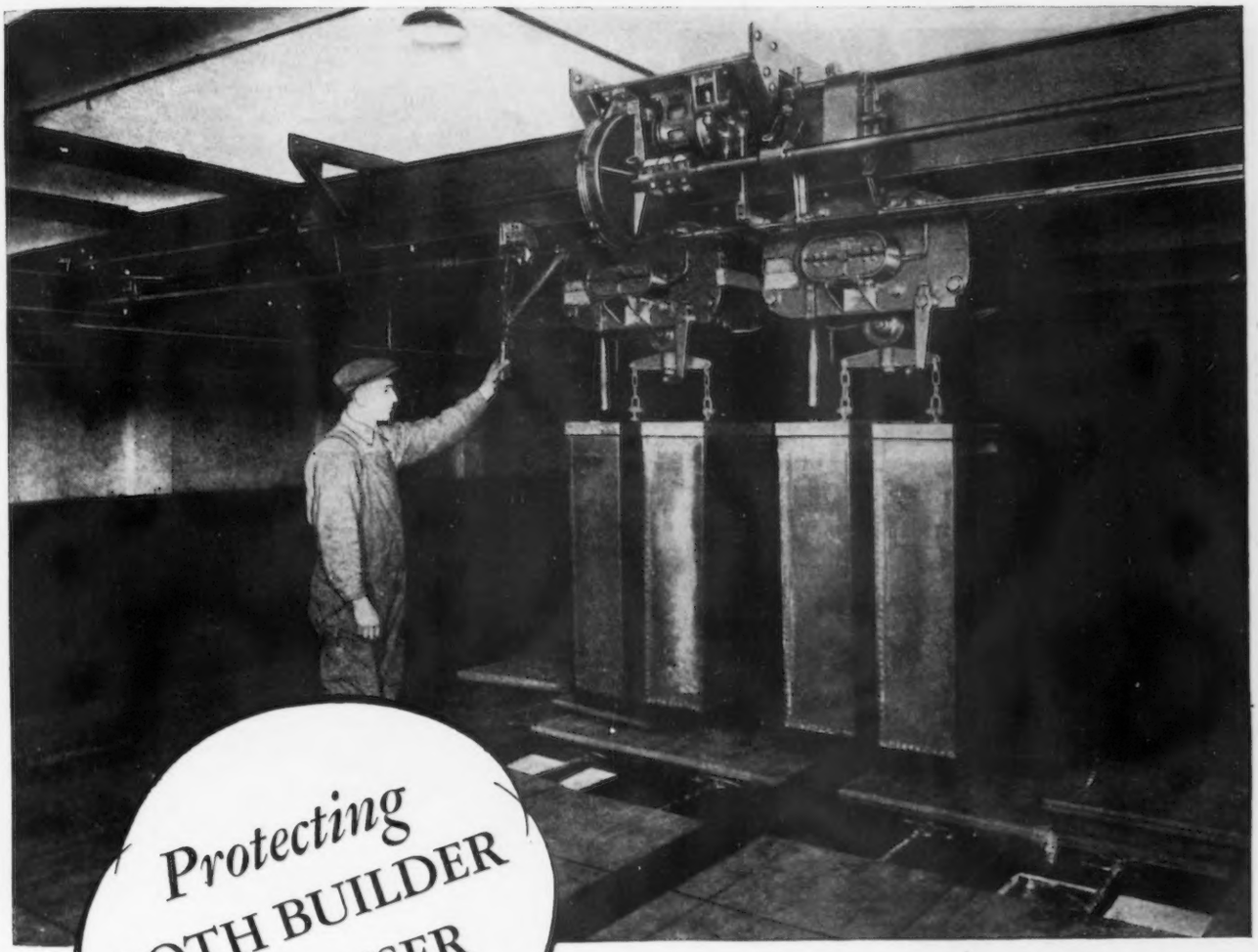
Reynolds Metals Co., Inc., 19 Rector Street, New York, has acquired Richmond Radiator Co., Uniontown, Pa., manufacturer of cast iron heating radiators, etc., and will operate as a subsidiary.

SOUTHWEST

Ordnance Office, Field Artillery School, Fort Sill, Okla., asks bids until June 3 for one wood-turning lathe and equipment (Circular 2).

Ozark Distillers, Inc., Fort Smith, Ark., A. S. Bullock, Merchants National Bank Building, secretary, has purchased local site and plans erection of new distillery, with power house, machine shop and other mechanical departments. Cost close to $100,000 with equipment.

Quaker Oats Co., Eleventh and Atchison Streets, St. Joseph, Mo., with headquarters at Chicago, will soon take bids on general contract for three-story addition to first noted plant, 180 x 221 ft. Cost over



Protecting BOTH BUILDER AND USER

The "Lo-Hed" Electric Hoist is a product of the AMERICAN ENGINEERING COMPANY of PHILADELPHIA. This hoist is completely Hyatt equipped. Hyatts are serving everywhere in material handling equipment because of their freedom from wear and care.

Universal use in all types of machinery and equipment evidences the preference for Hyatt Roller Bearings for such exacting assignments.

For wherever installed on wheels, drives, shafts and gears, Hyatt Roller Bearings prolong equipment life by withstanding gruelling punishment — by eliminating frictional drag and wear — and they accomplish this operating efficiency with a minimum of maintenance.

The builders who employ Hyatt Roller Bearings know what these better bearings mean to the smoother running, care-free performance of their equipment. Dual protection for builder and user alike. Hyatt Roller Bearing Company, Newark, Detroit, Chicago, Pittsburgh, Oakland.

HYATT

ROLLER BEARINGS

PRODUCT OF GENERAL MOTORS

$175,000 with equipment. It will be used in part for storage and distribution.

R. O. Mathews, Brownwood, Tex., is at head of project to erect a local electric light and power plant, including distribution lines for commercial service. Cost close to $175,000. Equipment purchases will be made soon under direction of H. O. Clark, 627 North Twenty-third Street, Waco, Tex., consulting engineer.

Laredo Independent School District, Laredo, Tex., Willis Galligan, school superintendent, plans installation of manual training equipment in four-story L-shaped high school, for which bids will be asked soon on general contract. Fund of $304,000 has been secured through Federal aid. Geisecke & Harris, Enfield Gracy Building, Austin, Tex., are architects; Guy M. Stout, Laredo, is associate architect. L. D. Royer, Smith-Young Tower, San Antonio, Tex., is mechanical engineer.

MIDDLE WEST

Intag Co., 2528 West Forty-eighth Place, Chicago, manufacturer of printing inks, etc., has let general contract to A. S. Low, 510 North Dearborn Street, for new two-story plant, 100 x 266 ft. Cost about $100,000 with equipment. Paul Gerhardt, 64 West Randolph Street, is architect.

Hiram Walker & Sons, Inc., Peoria, Ill., has let general contract to Lundoff-Bicknell Co., 100 North La Salle Street, Chicago, for three additions to distillery for storage and distribution. Cost over $100,000 with equipment. Smith, Hinchman & Grylls, Marquette Building, Detroit, are architects and engineers.

John Deere Tractor Co., Waterloo, Iowa, has let general contract to Jens Oleson & Sons Construction Co., 1670 Sycamore Street, for one-story addition, primarily for storage and distribution. Cost about $50,000 with equipment.

Board of Education, School District No. 1, Pueblo, Colo., plans manual training department in new two-story junior high school in North Side district. Cost over $200,000. Walter DeMordaunt, First National Bank Building, is architect.

Crystal Sugar Co., Chaska, Minn., has approved plans for extensions and improvements in power house, including additional equipment. Cost over $75,000 with machinery.

Philip Blum & Co., Inc., 35 East Wacker Drive, Chicago, wines and liquors, operating Old Mountaineer Distilling Co. and other distilleries, has leased four-story and basement building at Chicago Avenue and Kingsbury Street, about 50,000 sq. ft. floor space, and will remodel for new rectifying, bottling, storage and distributing plant.

Electric Gun Corpn. of America, Inc., Chicago, has been organized by John Pullman and Alva J. Carter, with registered office at 361 West Superior Street, to manufacture electrical appliances and equipment.

MICHIGAN DISTRICT

Turnmilling Corpn., Jackson, Mich., recently organized by G. W. Blackinton, Jackson, and associates, to manufacture machine specialties for milling forgings, etc., has acquired plant formerly occupied by Vulcan Engineering Co., totaling about 14,000 sq. ft. floor space, for new works. Mr. Blackinton will be president of company and C. B. DeVlieg, vice-president.

Pontiac Motor Division, General Motors Corpn., Pontiac, Mich., has plans for extensions and improvements, including new shop units and equipment. Cost about $1,000,000 with machinery. Fisher Body Corpn., Detroit, an affiliated organization, will carry out similar expansion at Pontiac works, for production of bodies for Pontiac cars. Cost approximately $2,000,000 with equipment.

Trenton Valley Distillers Corpn., Trenton, Mich., has let general contract to Culbertson & Kelly Co., 872 West Milwaukee Avenue, Detroit, for one and two-story addition, 50 x 150 ft., for mechanical-bottling works. Cost over $50,000 with machinery. George F. Diehl, 120 Madison Street, Detroit, is architect.

Benton Harbor Malleable Industries, Inc., Benton Harbor, Mich., has work under way on addition to die-casting division, to include additional equipment.

Tenbrook Corpn., 17 Cadillac Square, Detroit, has been organized by Andrew Tenbrook, 1143 West Euclid Avenue, and associates, to manufacture pipe fittings and allied specialties.

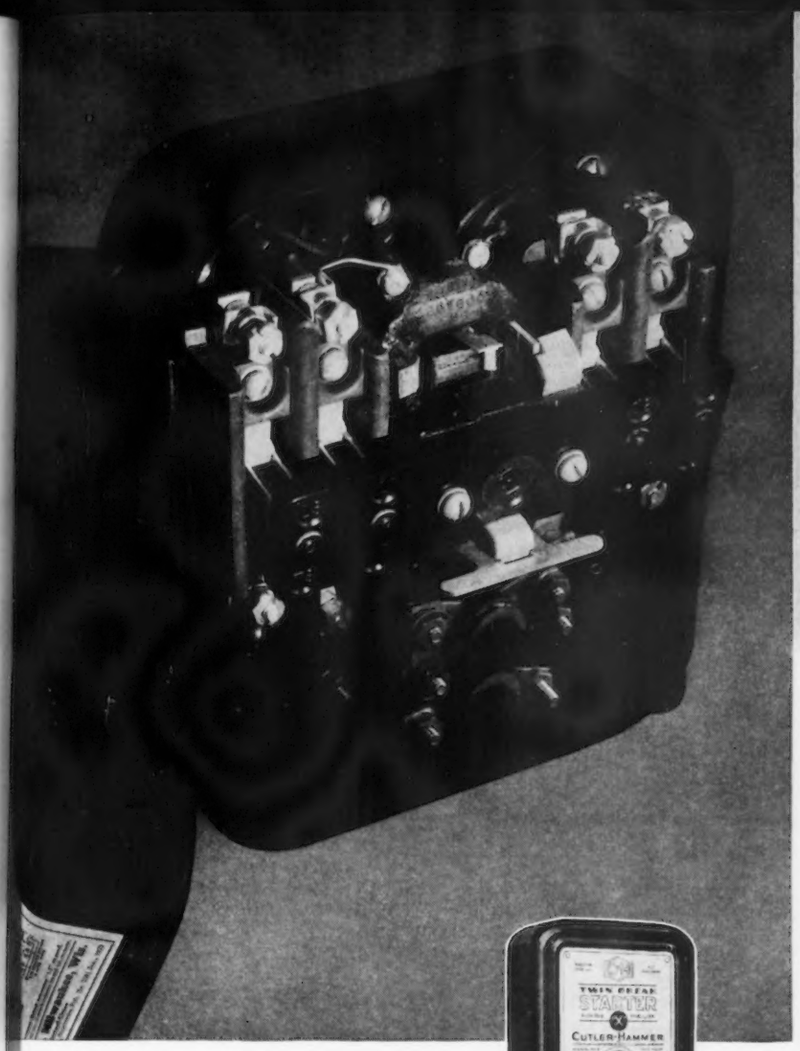
PACIFIC COAST

Bear Creek Vineyard Association, Ampere, San Joaquin County, Cal., has let general contract to Nelson & Wallace, Escalon, Cal., for one-story addition to winery, to cost about $35,000 with equipment. E. Ernst, 9 West Cleveland Street, Stockton, Cal., is architect.

Bureau of Reclamation, Denver, asks bids until May 21 for one 15-ton gantry crane for turbine draft tube bulkhead gates, Boulder power plant, Boulder Canyon Project, Arizona-California-Nevada (Specification 686-D); until May 27, wire and cable, same project (Specification 687-D); until June 5 for 12 72-in. diameter internal differential needle valves for tunnel plug outlet works, same project (Specification 628).

Independent Foundry Co., 2245 N. W. York Street, Portland, manufacturer of metal castings, plans rebuilding part of foundry recently destroyed by fire. Loss about $75,000 with equipment.

Seattle Brewing & Malting Co., Seattle,



THE WAY YOU WOULD BUILD A STARTER

C-H 9586 "AAA" STARTERS for 7½ h. p. 440-550 Volt, and Smaller, Motors

SET down the specifications for the perfect starter... Minimum contact troubles ... Minimum heat rise ... Protection of men and motors ... No "false starts" ... Simplicity, convenience ... Low contact resistance ... Low voltage drop ... Utterly dependable ... Can it be done? Check the C-H 9586 "AAA" against this list and see.

1. Heavy silver twin-break contacts render oxidation harmless. Operate on severest inching service at maximum h. p. Carry rated current with less than half permissible temperature rise.

2. Deep non-removable Thermoplax contact-pockets "soak-up" arc. No shields to misplace, no fragile parts. Contacts easily renewed; coils are readily changed. Only needed tool is screwdriver.

3. Twin-break contacts halve arc voltage.

4. C-H Overload Relay provides absolute protection ... maximum production. Changes for current-rating and type of motor made simply by changing heater coil.

5. Designed to prevent contacts closing due to jarring, etc., until starter button is pushed.

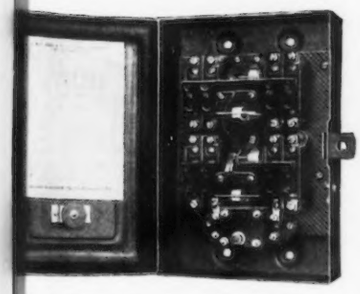
6. Fewer parts. No pigtails to break. *Loosening* one screw dismounts entire control panel. All parts easily accessible and demountable.

7. Convenient wiring channel between case and control panel. All leads brought in top or bottom.

8. Minimum of current-carrying joints. Low contact resistance. Low voltage drop.

9. Stocked by responsible independent electrical wholesalers everywhere.

What is the verdict? Those twin-break silver-shod contacts, that structure based on heavy duty steel mill control design—these are typical reasons for C-H Motor Control Leadership, reasons for C-H 9586 "AAA" standardization in so many plants, reasons why you, too, should standardize on C-H. CUTLER-HAMMER, Inc., *Pioneer Manufacturers of Electric Control Apparatus,* 1325 St. Paul Ave., Milwaukee, Wisconsin.



"AAA" Performance in C-H Reversing Starters, too

The same ruggedness and certainty of C-H 9586 "AAA" Starters is brought to other types of C-H control through the use of the same mechanism ... Picture shows Bul. 9595 Reversing Starter, vertical type. Also made in horizontal and back-to-back styles.

CUTLER HAMMER C-H MOTOR CONTROL

Starts, Stops, Regulates, Protects Industry's Motors

(B-2156)

has been organized to take over Century Brewing Association, Seattle, and Rainier Brewing Co., San Francisco. Plans are under way for extensions and improvements in Century plant, including equipment. Cost close to $200,000 with machinery. Louis Hemrich, president of Rainier company, will be chairman of board of new organization, and Emil G. Sick, president of Century company, president.

Silver Springs Brewing Co., Bay Street, Port Orchard, Wash., recently organized to take over plant and business of Kitsap Brewing Association, plans extensions and improvements, including additions for mechanical bottling and storage and distribution. Cost about $50,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 28 for two motor-driven ship service air compressors and spare parts for San Pedro, Los Angeles, yard (Schedule 5045); until May 24 for 12 400-kw. turbo-generators, 12 regulators, 12 circuit breakers and spare parts (Schedule 5026), for Puget Sound yard.

◀ FOREIGN ▶

Columbus-McKinnon Chain Corpn., Tonawanda, N. Y., plans establishment of new branch plant at Vereeniging, Transvaal, South Africa. Cost over $75,000 with equipment.

Board of Tyne Commissioners, Newcastle-on-Tyne, England, has plans for new deep-water dock and terminal at Jarrow Slake, River Tyne, providing facilities for vessels up to 30,000 tons. Installation will include cranes, loaders, conveyors and other mechanical-handling equipment. Fund of £750,000 (about $3,750,000) has been authorized for project.

Ministry of Labor, Government of France, Paris, is planning new works for production of gasoline from coal under distillation process in Lievin-Angres district, with power house, machine shop and other mechanical departments. Cost over $2,000,000 with equipment.

Pacific Oil Co., Ltd., of Canada, Montreal, plans new oil refinery at Pointe Aux Thembles, Que. Cost about $175,000 with machinery.

Boye & Emmes has Fortieth Anniversary

FINE traditions of the machine tool industry are again commemorated this year in the fortieth anniversary of the Boye & Emmes Machine Tool Co., of Cincinnati.

In 1895 a partnership was formed in that city under the name of Dietz, Schumacher & Co. for the manufacture of engine lathes. In the following year, 1896, F. W. Boye, Jr., entered this partnership, the name of the concern being changed to Dietz, Schumacher & Boye. With the retirement in 1900 of Jacob Dietz the name was again changed to Schumacher & Boye.

Then, in 1912, Mr. Boye purchased Mr. Schumacher's interest and the company was incorporated under the name of the Boye & Emmes Machine Tool Co., Mr. Emmes having been the superintendent of the plant for some 12 years prior to that time. Although Mr. Emmes passed away in May, 1928, the company has continued under the same name with F. W. Boye, Jr., still actively directing the business after doing so for nearly all of the 40 years of its existence.

The purpose of the company at its formation in 1895 being to build engine lathes, this one product has continued throughout the years as the sole occupation of this concern. Several thousand of its machines are in use not only in the United States but throughout the world. So strongly has the Boye & Emmes Machine Tool Co. concentrated on the building of engine lathes that when a few years ago their plant was destroyed by fire, a new one was immediately constructed with its layout and facilities specifically designed for the economical and efficient production of the one product; namely, high grade precision engine lathes. The present plant on Caldwell Drive in Hartwell, a suburb of Cincinnati, was erected in 1930 and is thus one of the most modern of the machine tool industry.

Boye & Emmes engine lathes are sold through 28 exclusive dealers covering all principal cities of this country and its general distributor in charge of sales direction is Bryant Machinery & Engineering Co., with main office in Chicago.

Congratulations are being received from his host of friends in the industry by the president of the company, F. W. Boye, Jr., on his company's anniversary and upon his continued active direction of its affairs. Other present officers of the company are F. C. Reif, secretary; F. W. Boye, III, treasurer, and George A. Mohr, works manager.

Manufacturers See End of Depression

BASED upon an extensive study of the economic situation, the National Association of Manufacturers, speaking for industrialists throughout the nation, has stated that "careful analysis of the business outlook indicates that this country today is closer to breaking the back of the depression than at any time since the forces of recovery began working through the world in 1932."

The analysis showed that billions of dollars of stored up demand which, if unloosed, would dwarf the Federal relief appropriation, await only the clearing away of political uncertainties.

While urging that Congress and the Administration recognize that any legislation which would delay recovery in the next few months be shelved, the association called upon every manufacturer in the country to "follow with full and complete support a program which would muster the full force of American initiative against the walls of depression during the next few months."

Demonstrating

The High Welding Qualities of

Manganese-Vanadium Steel

Test bars and camera prove the exceptional welding qualities of Manganese Vanadium Steel:

A tensile test specimen cut from a section of 1½" Manganese Vanadium plate welded with Manganese Vanadium welding rod and machined in reduced diameter so as to break in the weld, showed the following physical properties of the weld:

Yield Point: 69,550 pounds (plate: 61,650 pounds).

Tensile Strength: 84,350 pounds (plate: 82,700 pounds).

Another specimen, taken through the wide portion of the "V" weld (note unretouched photograph) was bent as shown in the second illustration.

An extensive series of competitive tests on commercial tonnages of plates and shapes demonstrated that Manganese Vanadium Steel exhibited less tendency to air harden in the welded zone than any of the other steels tested.

For many types of structural applications, Manganese Vanadium Steel, with its high physical properties and exceptional welding qualities, holds unusual possibilities for weight reduction and product improvement. Write for data.

VANCORAM

FERRO-ALLOYS

of vanadium, silicon, chromium, titanium, and silico-manganese, produced by the Vanadium Corporation of America, are used by steel makers in the production of high-quality steels.

VANADIUM CORPORATION OF AMERICA

120 BROADWAY, NEW YORK, N. Y.

CHICAGO — PITTSBURGH *Bridgeville, Pa.* — DETROIT

Plants at Bridgeville, Pa., and Niagara Falls, N. Y.
Research and Development Laboratories, Bridgeville, Pa.

VANADIUM STEELS

for strength, toughness and durability

Special Atmospheres in the Heat Treatment and Brazing of Metals

(CONTINUED FROM PAGE 22)

parts, such as screws, bolts, pins, links, etc., in an atmosphere which will eliminate oxidization of the materials.

A typical illustration would be to heat for quenching small parts in a gas-tight electric furnace of the standard chain-belt conveyor type to which is supplied an Elfurno gas atmosphere. At the discharge end of the furnace conveyor a discharge chute is provided. The chute is sealed in the quenching medium (viz. oil or water) in a conveyor-type quenching tank situated below the furnace. The scale-free heating of the materials, particularly those parts such as screws and bolts which are threaded, allows for closer manufacturing limits and hence a superior product at no appreciable increase in cost.

The heat treatment of automotive and similar parts in controlled atmospheres to prevent decarburization has been developed to a small extent, but the problem is very complex and a great deal remains to be done in the way of development before we can elaborate upon it properly.

However, in the writers opinion, the time is not far distant when most heat treating operations of finished or semi-finished parts will be accomplished with a control of oxidization and control of carbon where necessary.

It is the writer's hope that he has conveyed to you the flexibility of control which can be accomplished with simple and cheap gas atmospheres, starting with a common basic principle in their production.

A few designs of furnace equipments which have been practically applied to the processes enumerated are shown in the illustrations.

Two-Millionth Patent Issued by U. S.

WASHINGTON, May 10.—The two-millionth patent granted by the United States Patent Office since the beginning of the present series in 1836 was issued April 30 to Joseph Ledwinka, chief engineer of the Edward G. Budd Mfg. Co., of Philadelphia, to which the patent is assigned.

The patent, issued on an improvement for pneumatic tires for railroad cars, is not only the two-millionth granted by the Patent Office but the two hundred-forty-eighth awarded Mr. Ledwinka whose work during the last 36 years has had a marked influence upon the development of the modern automobile and streamlined train. He received his first patent in 1899 on a "means of propulsion of vehicles by electricity." It was No. 638,643.

Perhaps Mr. Ledwinka's most important single contribution to the automobile's development was the all-steel body which was first promoted by the Budd Company and which is now in almost universal use. Another is a process for the drying of lacquered bodies and parts by electric induction employed today in some of the leading automobile plants. He also has made important inventions in connection with the light-weight, stainless steel, streamlined trains built by the Budd company.

Iron Content of Ore Lower

THE average iron content of Lake Superior ore in 1934 was 51.56 per cent iron natural, a slight decline from the previous year, when the average content was 51.85 per cent, according to the average analysis report of the Lake Superior Iron Ore Association. In 1932 the average content was 52.16 per cent. However, with the exception of the two previous years the average content of 1934 was the highest since 1926.

The average iron content of low phosphorus non-Bessemer ore last year was 51.16 per cent, as against 51.45 per cent the previous year, which was the highest in several years. The average iron content of Bessemer ore gained slightly, being 54.70 per cent, as against 54.30 per cent during 1933.

The average analyses of all ores mined in the Mesabi district in 1934 showed an iron content of 51.23 per cent, as against 51.26 per cent the previous year.

Reports Refractory Deterioration

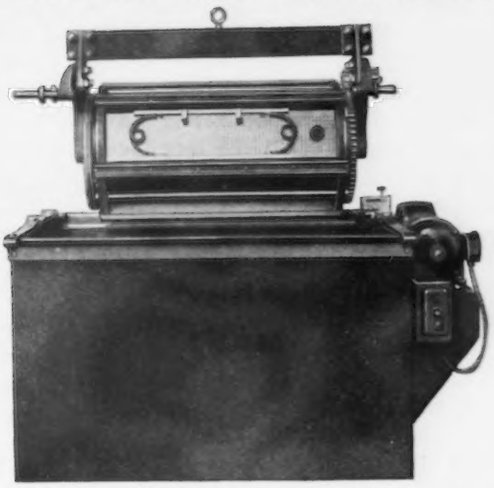
DURING the recent convention of open-hearth superintendents at Cincinnati, a paper was read by L. B. Miller of the Johns-Manville Research Laboratory, Manville, N. J., on the relative changes occurring in refractory brick in the roofs of insulated and uninsulated open-hearths. In the report of this meeting in THE IRON AGE of April 18 Dr. Miller was mistakenly reported as being connected with General Refractories Co.

TWO OUTSTANDING CONTRIBUTIONS to the ELECTROPLATING INDUSTRY

RHEOSTAT

● Accurate current regulation and ruggedness are the features of the new Udylite Rheostat. . . . Cam-type, self-cleaning switches make perfect contact with bus bars which ensures proper transmission of current. . . . Metal parts are Udylited for rust prevention. . . . No effort has been spared to produce a high quality instrument which will function accurately under severe conditions. . . . The Udylite Rheostat is made in all sizes for any electroplating process.

PLATING BARREL



● The Udylite Plating barrel is the sturdiest and most efficient ever built! . . . Made of the strongest possible combination of materials—special shock-resistant rubber and steel—this plating barrel will produce more work at an absolute minimum of maintenance cost. . . . Proper insulation and charging all submerged steel members anodically eliminate treeing. All of the current goes to the work! . . . This is the barrel you have been waiting for!

WRITE *FOR* THESE FOLDERS

THE UDYLITE COMPANY

1651 East Grand Blvd., Detroit, Mich.

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THE FOURTH DIMENSION IN SPACE BUYING — EDITORIAL INFLUENCE

By Mabel Potter Hanford
BATTEN, BARTON, DURSTINE & OSBORN, INC.

Among the several hundred business papers which go across my desk each month there are far too many which take the advertising page more seriously than the editorial section. This attitude is reflected in the amazing record of solicitations which never attempt in any way to sell the editorial content of the publication to the space buyer. To lapse into the vernacular, I have seen some space representatives get very much "het-up" about circulation and coverage, their own and their competitors' ABC reports, but I have found too few who talk about their editor at all, much less get "het-up" about him.

I think we sometimes forget that there is a *fourth* dimension to space selling and buying. The first three are the market, the circulation method, and the coverage of the market. The fourth dimension which is almost entirely ignored is the all-important one —the editor.

When I have asked some space salesmen, "Who is your editor?" they have stared at me in astonishment. And some have had to go back into the depths of memory to recall his full name. I am then impelled to change my question to, "Where does he stand in your field? What is his reputation among leaders in your industrial coverage? Does he speak with the voice of authority? Is what he says listened to by the trade or industry?"

The millennium will come to advertising, of course, when we can provide every client with a business paper schedule showing nothing but audited papers published and edited by the leaders in each field. Until that time, however, we must base our recommendations upon a happy balance between the four dimensions which influence business-paper space buying.

Elusive as personality is, it seems to me that there is more of it in the publishing business than in any other industry. The magazine, or newspaper, is the voice of that personality and all the talking by the space man cannot disguise that personality back in the editor's office. If a space buyer has not learned to recognize the personality of the publication he cannot purchase advertising space with best efficiency.

This "feel" is 75 per cent effected by the editorial pages, which reflect the editor *plus* his publisher, who may, or may not, be actively present across the desk.

To get this indescribable "feel," it is necessary for the publications to reach the space buyer's desk. He cannot possibly read all of 1400 business papers. He may open and glance through only a few. Or he may toss them, wrapper and all, in the box for the library. Frequently, his strict perusal depends upon his active interest at that time in the field covered by the magazine. But never doubt that the publication is making its very vivid impression on him.

It is a sort of sixth sense which the space buyer develops regarding this editorial personality—a sixth sense which has marked the downfall of many a publication. Within the past year, for instance, an excellently printed and published retail paper closed its doors. Why? Nothing wrong with its editor or its publisher except that they published a magazine almost entirely from the *advertising* point of view. They forgot that their market was not an advertising man, but a merchant. It speaks for the sane balance of space buyers that their own "advertising-minded" impulse did not betray their all-important "sixth" sense.

One fundamental must be recognized in all space buying. It may be the advertiser who foots the particular publisher's bill, but the reader must eventually reimburse the advertiser through sales, direct or otherwise, or the magazine must drop out of the publishing fold.

The only kind of an editor a trade paper should have is a man who would write his page exactly the same whether or not there was a single line of advertising in the entire book.

Such an editor preserves that priceless ingredient—the integrity of the publisher. I often wonder what a manufacturer really thinks of a publisher who offers considerable free publicity, either in return for an advertising contract or in hope of one. Some publicity is news of real value to the reader, but the kind of publicity I am talking about is the kind that may easily be the key which unlocks the editor's door to let the wind blow editorial authority and integrity out of the window.

In other words, if the editor has the respect of his publisher and the attention of his readers, he will go out of his way to avoid giving his readers material which they quickly sense is pure publicity. I mention the publisher because, after all, it is he who holds the purse strings and the editor is, perforce, his employee. Too many publishers demoralize their editors by insisting on publicity items. The editor knows that most of it is not news. And he knows that his readers know it is not news!

Buying space in business papers is buying a specific audience. It may be limited to 1500 or it may run up into thousands. The number is immaterial except that the space buyer, of course, likes to reach as many of the market as possible through a publication which the market respects and whose editor speaks with authority.

The importance of circulation and coverage need not be questioned, but it is my opinion that these must be subordinated to the integrity and stability of the editorial chair. Renewal percentages speak no more eloquently of the method of subscription campaigns than they do of the standing and the audience-acceptance of the editorial chair. When renewals begin to slip below 50 per cent I do not consider the method by which these subscriptions were obtained, as much as

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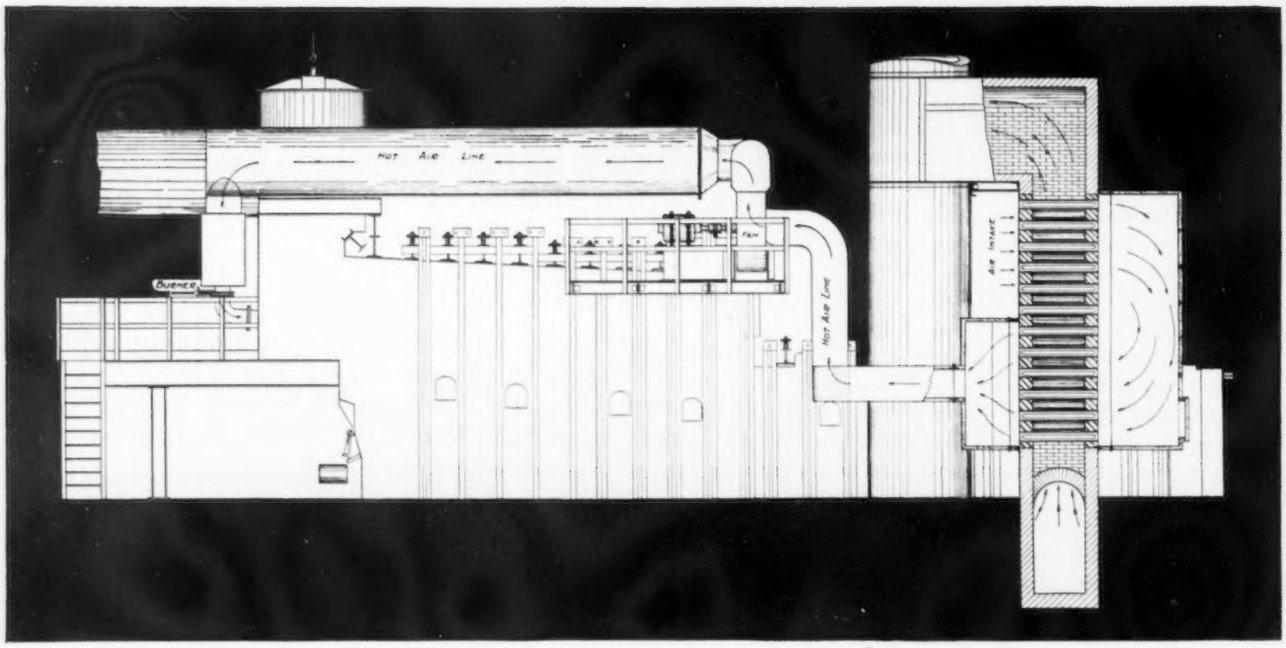
I consider the editor. If he speaks with authority, unhampered by a publisher who sells advertising with a premium of publicity; if he knows his subject and how to present it to his audience—then his readers will want to keep in contact with him.

Another angle on space buying which concerns the editorial desk is important because it is a human angle, and therefore not entirely controllable. The personality of the paper must not be confused in the space buyer's mind with the printing job! It is not easy to judge a business paper without personal bias. I am talking not about personalities of space selling and space buying, but about the advertising sense of the artistic and beautiful in printing.

I can't imagine any space buyer placing a contract with such beautifully printed books as *Fortune* or *Advertising Arts* or *Apparel Arts* without a sense of satisfaction. Here, fortunately, the beauty of the publishing and printing job appeals almost as strongly to the market as to the advertiser and space buyer, so that such a purchase for some advertisers is both logical and efficient. Few artists or copy writers or space buyers with an active sense and eager eye for beauty in publishing and printing get highly excited, however, about certain business or trade papers. Yet many of these publications are excellent examples of successful publishing jobs attuned to a particular audience with a record of potent advertising pages.

It is difficult for the advertiser or the copy man to be coldly critical and calmly neutral when, after all, advertising is a *creative* job. Yet space buying itself is the vision of seeing that an advertisement is placed where it will have the best opportunity to tell its story to a responsive audience. The space buyer who has established for himself a record for integrity in buying, who never forgets the *Fourth Dimension*, can, I believe, be trusted to plan a trade-paper schedule which will prove exceedingly important in the advertising program.

It is very easy to apply this Recuperator to present furnaces



A CASE in point is the recuperator layout for a producer gas fired, continuous billet heating furnace, as illustrated. Existing flues and stack are used. There is a decided saving in fuel, and of course money, in this installation. There are no changes in the furnace proper.

Add accessibility, ease and convenience in repairs, high efficiency, and durability and it is then easy to see why more and more operators of various types of furnaces have installed The Carborundum Company's recuperator.

Savings of 25% to 35% in fuel costs are not unusual, due to recuperation. The "Carbofrax" Tubes assure efficient heat recovery. They can withstand the severest of temperature conditions.

Let us study your furnace conditions and show you how your operating costs can be reduced.

THE CARBORUNDUM COMPANY'S
REG. U. S. PAT. OFF.

RECUPERATOR

Equipped with "Carbofrax" Tubes
REG. U. S. PAT. OFF.

A Product of **THE REFRACTORY DIVISION,** *Perth Amboy, N. J.*

District Sales Branches: Boston, Chicago, Cleveland, Detroit, Philadelphia, Pittsburgh. Agents: L. F. McConnell, Birmingham, Ala.: Christy Firebrick Company; St. Louis; Harrison & Company, Salt Lake City, Utah; Pacific Abrasive Supply Co., Los Angeles, San Francisco, Seattle; Denver Fireclay Co., El Paso, Texas. Williams and Wilson, Ltd., Montreal, Toronto, Canada. (Carborundum and Carbofrax are registered trade-marks of The Carborundum Company.)

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VI-Silico-Manganese Steels

SILICON is a powerful deoxidizing agent, and manganese to a lesser degree behaves in the same manner. Manganese also exerts beneficial effects on the physical properties of heat-treated steel. Silicon increases strength. The balanced combination of both elements produces a steel of unusually high strength and one with sufficient ductility for the services to which it is adapted.

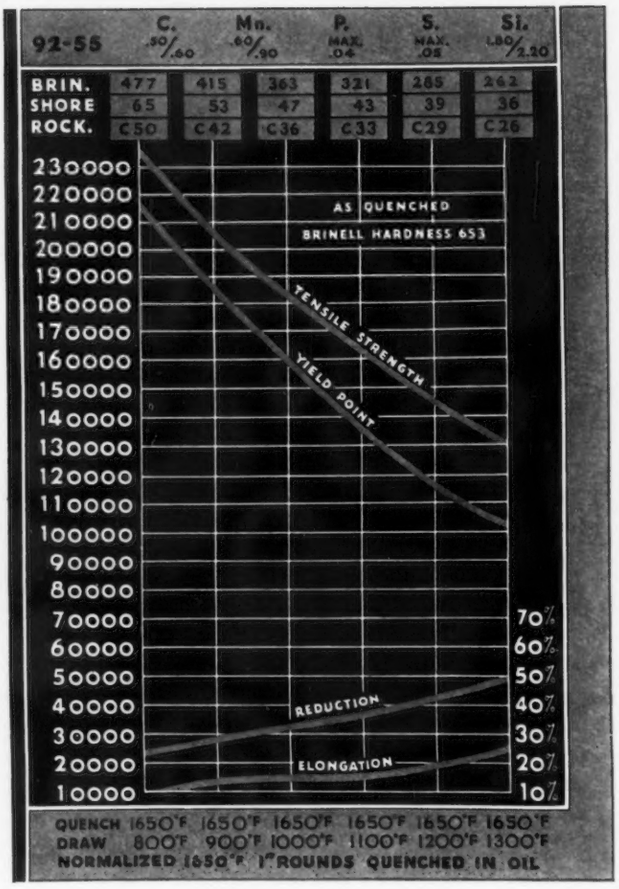
The silico-manganese steels are grouped under the S. A. E. 92xx Series and contain about 2.00 per cent silicon and 0.80 per cent manganese. The carbon content varies in accepted ranges from 0.48 to 0.67 per cent, depending on the application and the heat-treatment requirements.

One of the most important applications of silico-manganese steels is for springs, both in the railway and automotive fields. Bethlehem pioneered the application of silico-manganese steel to springs more than 25 years ago. In the years that have elapsed since its introduction, continuous effort has been put forth to bring out the full latent possibilities of this steel as spring material.

A spring dissipates energy, mainly through internal strain friction. If this internal strain is within the elastic limit of the material, it will ordinarily not cause fatigue—provided there is sufficient time between flexures to permit the metal to recover. Severe stresses, though within the elastic limit, if occurring in quick succession are to some extent cumulative in their effects on the steel. Fatigue may follow. Proper methods of manufacture and effective heat treatment insure maximum endurance.

As Bethlehem makes silico-manganese steels for springs, the surface is carefully processed at all stages to avoid imperfections that might provide a starting place for fatigue. Special care is exercised in rolling to obtain cold-shearing qualities and, in the case of flat sections, punching and trimming qualities. The uniformity of the structure is controlled with extreme accuracy to insure both high inherent fatigue resistance and uniform heat-treating characteristics.

Although silico-manganese steels have their principal use for springs, they have also been successfully used for chisels, drift pins, punches, digging bars, shear blades, mine bits and pulp-beater bars. They respond readily to oil quenching and, when drawn to the correct temperature, possess, in addition to the strength required for springs, excellent toughness and resistance to shock.



★ *Physical properties of S. A. E. 92-55, a silico-manganese spring steel.* ★